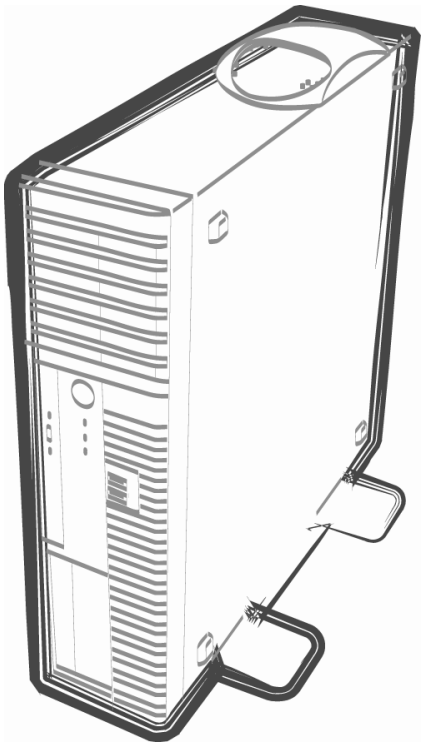
Express5800

NEC



NEC Express Server
Express5800 Series

Express5800/GT110d-S, GT110d-S (2C/i3-2120) EXP281A User's Guide

Model Number: N8100-1739F/1740F/1741F/1742F

Chapter 1 General Description

Chapter 2 Preparations

Chapter 3 Setup

Chapter 4 Appendix

10.020.01-101.02
August 2011, Second Edition

© NEC Corporation 2011

Documents Provided with This Product

Documents for this product are provided as accompanying booklets(📖) and as electronic manuals(PDF) stored within the EXPRESSBUILDER DVD(💿).

📖 Precautions for Use	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
📖 Getting Started	Describes how to use this server, from unpacking to operations. Refer to this guide as you begin for an overview of this server.

💿 EXPRESSBUILDER

PDF User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server's parts
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and ideal location for this server
Chapter 3: Setting Up Your Server	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications and other information

PDF Installation Guide (Windows)

Chapter 1: Installing Windows	Installation of Windows and drivers, and important information for installation
Chapter 2: Installing the Bundled Software	Installation of bundled software, such as ESMPRO and Universal RAID Utility

PDF Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2: Convenient Features	Useful features and the detail of system BIOS settings, RAID Configuration Utility, and EXPRESSBUILDER
Chapter 3: Appendix	Error messages and Windows Event Logs

PDF Other documents

Provides the detail of ESMPRO, Universal RAID Utility, and the other features.

Contents

Documents Provided with This Product 2

Contents 3

Notations Used in This Document 7

Notations used in the text 7

Optical disk drives 7

Hard Disk Drives 7

Removable media 7

Abbreviations of Operating Systems 8

Trademarks 9

Regulatory Notices 10

Warnings and Additions to This Document 11

Latest editions 11

Precautions for Use (Be Sure to Read) 12

Safety precautions 12

Symbols used in this document and on warning labels 13

Safety notes 14

General 14

Power supply and power cord use 15

Installation, relocation, storage, and connection 17

Cleaning and working with internal devices 18

During operation 19

Warning labels 20

Handling precautions (for proper operations) 21

Chapter 1 General Description 24

1. Introduction 25

2. Accessories 26

3. Standard Features 27

3.1 Management Features 29

3.2 Firmware and Software Version Management 30

4. Names and Functions of Parts 31
4.1 Front of the server 31
4.2 Rear view 33
4.3 Internal view 34
4.4 Motherboard 38
4.5 Status Indicators 39
4.5.1 Power LED ( ) 40
4.5.2 Status LED ( ) 40
4.5.3 Disk access LED ( ) 41
4.5.4 Optical disk access LED 41
4.5.5 Disk LED 41
4.5.6 LINK/ACT LED (1, 2, M) 41
4.5.7 Speed LED (1, 2, M) 42

Chapter 2 Preparations 43

1. Installing Internal Optional Devices 44
1.1 Safety Precautions 44
1.2 Anti-static Measures 45
1.3 Overview of Installation and Removal 46
1.4 Removing the Side Cover 47
1.5 Removing the Front Bezel 48
1.6 Internal Flash Memory 49
1.6.1 Installation 49
1.6.2 Removal 49
1.7 DIMM 50
1.7.1 Maximum supported memory size 51
1.7.2 Installation order 51
1.7.3 Installation 52
1.7.4 Removal 53
1.8 Use of Internal Hard Disk Drives in the RAID System 54
1.8.1 Notes on setting up a RAID System 57
1.9 Extra Battery for RAID Controller 60
1.9.1 Handling precautions 60
1.9.2 Installing N8103-121 extra battery 60
1.9.3 Installing N8103-141 extra battery 70
1.9.4 Removal 77

1.10 PCI Card 78
1.10.1 Notes 79
1.10.2 List of option devices and installation slots 80
1.10.3 Installation 84
1.10.4 Configuration after installing 85
1.10.5 Removal 86
1.10.6 Installing the N8117-01A expansion RS-232C connector kit 87
1.11 3.5-inch Hard Disk Drive 90
1.11.1 Installation 91
1.11.2 Removal 93
1.12 2.5-inch Hard Disk Drive 94
1.12.1 Installing an expansion 2.5-inch HDD cage 95
1.12.2 Installation 97
1.12.3 Removal 98
1.12.4 Removing the 2.5-inch HDD cage for additional drives 98
1.13 Optical Disk Drive 99
1.13.1 Replacing drives 99
1.13.2 Removal 99
1.14 Backup devices 100
1.14.1 Installation 101
1.14.2 Removal 102
1.15 Connecting cables 103
1.15.1 Interface cables 103
1.15.2 Power cables 111
1.16 Attaching the Front Bezel 112
1.17 Installing the Side Cover 113

2. Ideal Location and Connection 114
2.1 Ideal location for the server 114
2.1.1 Preparation for installation 116
2.2 Connection 119
2.2.1 Interface cables 120
2.2.2 Power cord 122

Chapter 3 Setup 123

1. Turning on the Server 124
   1.1 POST 125
      1.1.1 POST sequence 125
      1.1.2 POST Error Messages 127

2. System BIOS Setup 128
   2.1 Overview 128
   2.2 Starting SETUP Utility 128
   2.3 Description on On-Screen Items and Key Usage 129
   2.4 Cases that Require Configuration 131

3. EXPRESSSCOPE ENGINE 3 133
   3.1 Overview 133
   3.2 EXPRESSSCOPE ENGINE 3 Network configuration 133

4. EXPRESSBUILDER 135
   4.1 Features of EXPRESSBUILDER 135
   4.2 Starting EXPRESSBUILDER 135

5. Installing Software Components 136

6. Turning Off the Server 137

Chapter 4 Appendix 138

1. Specifications 139
   1.1 Air-cooling System 139
   1.2 Water-cooling System 140

2. Interrupt Lines 141

Notations Used in This Document

Notations used in the text

In addition to safety-related symbols urging caution, 3 other types of notations are used in this document. These notations have the following meanings.

Important	Indicates critical items that must be followed when handling the server or operating software. If the procedures described are not followed, **server failure, data loss, and other serious malfunctions could occur**.
Note	Indicates items that must be confirmed when handling the server or operating software.
Tips	Indicates information that is helpful to keep in mind when using this server.

Optical disk drives

This server is equipped with one of the following drives, depending on the order at the time of purchase. These drives are referred to as *optical disk drives* in this document.

- **DVD-ROM drive**
- **DVD Super MULTI drive**

Hard Disk Drives

Unless otherwise stated, Hard Disk Drives (HDD) described in this document refer to the following.

- **Hard disk drives (HDD)**
- **Solid state drive (SSD)**

Removable media

Unless otherwise stated, removable media described in this document refer to the following.

- **USB memory**
- **Flash FDD**

Abbreviations of Operating Systems

Windows Operating Systems are referred to as follows.

Notations in this document	Official names of Windows
Windows Server 2008 R2	Windows Server 2008 R2 Standard Windows Server 2008 R2 Enterprise Windows Server 2008 R2 Foundation
Windows Server 2008[*1]	Windows Server 2008 Standard Windows Server 2008 Enterprise
Windows Server 2003 R2 x64 Edition	Windows Server 2003 R2 Standard x64 Edition Windows Server 2003 R2 Enterprise x64 Edition
Windows Server 2003 R2[*2]	Windows Server 2003 R2 Standard Edition Windows Server 2003 R2 Enterprise Edition
Windows Server 2003[*2]	Windows Server 2003 Standard Edition Windows Server 2003 Enterprise Edition
Windows PE	Windows Preinstallation Environment

*1: Includes 64-bit and 32-bit Editions unless otherwise stated.
The following appears on EXPRESSBUILDER screen.

- Windows Server 2008 64-bit Edition: Windows Server 2008 x64
- Windows Server 2008 32-bit Edition: Windows Server 2008 x32

*2: Unless otherwise stated, Windows Server 2003 R2 and Windows Server 2003 are collectively referred to as Windows Server 2003.

Supported Operating Systems differ depending on the model of this product. For details, see the following table.

Editions or Families of Windows	GT110d-S
Windows Server 2008 R2 Standard	✓
Windows Server 2008 R2 Enterprise	✓
Windows Server 2008 R2 Foundation	✓
Windows Server 2008 Standard	✓
Windows Server 2008 Enterprise	✓
Windows Server 2003 R2 Standard x64 Edition[*1]	✓
Windows Server 2003 R2 Enterprise x64 Edition[*1]	–
Windows Server 2003 R2 Standard Edition[*1]	✓
Windows Server 2003 R2 Enterprise Edition[*1]	–
Windows Server 2003 Standard Edition[*1]	✓
Windows Server 2003 Enterprise Edition[*1]	–
Windows PE	–[*2]

*1: Service Pack2 or later.
*2: Used as an installation platform only.
✓: Supported –: Not supported

Trademarks

ESMPRO and EXPRESSSCOPE are registered trademarks of NEC Corporation.
Microsoft, Windows, Windows Server, Windows Vista, and MS-DOS are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries. Intel, Pentium, and Xeon are registered trademarks of Intel Corporation of the United States. AT is a registered trademark of International Business Machines Corporation of the United States and other countries. Adaptec, its logo, and SCSI Select are registered trademarks or trademarks of Adaptec, Inc. of the United States. LSI and the LSI logo design are trademarks or registered trademarks of LSI Corporation. Adobe, the Adobe logo, and Acrobat are trademarks of Adobe Systems Incorporated. DLT and DLTtape are trademarks of Quantum Corporation of the United States. PCI Express is a trademark of Peripheral Component Interconnect Special Interest Group. Linux is a trademark or registered trademark of Linus Torvalds in Japan and other countries. Red Hat® and Red Hat Enterprise Linux are trademarks or registered trademarks of Red Hat, Inc. in the United States and other countries.

All other product, brand, or trade names used in this publication are the trademarks or registered trademarks of their respective trademark owners.

Regulatory Notices

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CE Statement

This is a Class A product. In domestic environment this product may cause radio interference in which case the user may be required to take adequate measures (EN55022).

BSMI Statement

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Warnings and Additions to This Document

1. **Unauthorized reproduction of the contents of this document, in part or in its entirety, is prohibited.**
2. **The contents of this document may change without prior notice.**
3. **Do not make copies or alter the document content without permission from NEC Corporation.**
4. **Every effort has been made to ensure the completeness of this document. However, if you have any concerns, or discover errors or omissions, please contact your retailer.**
5. **Regardless of these 4 items, NEC Corporation assumes no responsibility for effects resulting from operations.**
6. **The sample values used in this document are not the actual values.**

Keep this document nearby so that you may refer to it as necessary.

Latest editions

This document was created based on the information available at the time of its creation. The screen images, messages and procedures **may differ from the actual screens, messages and procedures.** Substitute as appropriate when content has been modified.
The most recent version of User's Guide, as well as other related documents, is also available for download from the following website.

http://www.nec.com/

Precautions for Use (Be Sure to Read)

The following provides information required to use your server safely and properly. For details of names in this section, refer to *Names and Functions of Parts* in this document.

Safety precautions

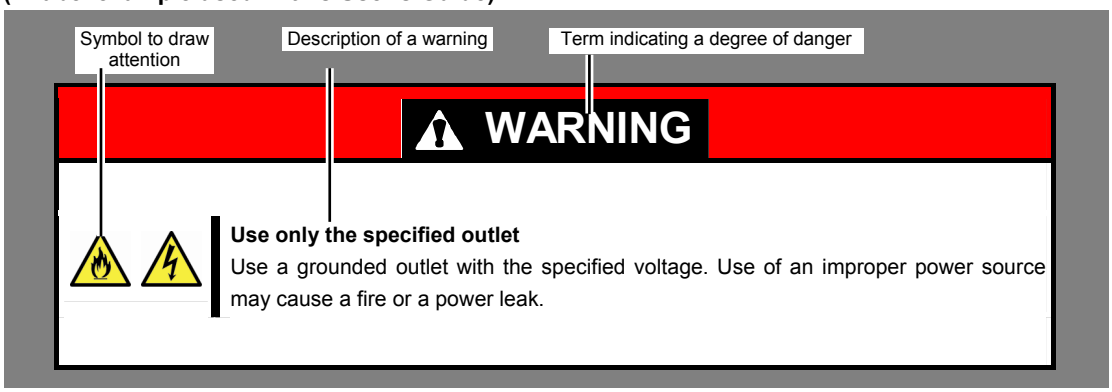
Follow the instructions in this document for the safe use of the NEC Express server.
This User's Guide describes hazardous parts of the server, possible hazards, and how to avoid them. Server components with possible danger are indicated with a warning label placed on or around them (or, in some cases, by printing the warnings on the server).
In User's Guide or on warning labels, **WARNING** or **CAUTION** is used to indicate a degree of danger. These terms are defined as follows:

WARNING	Indicates there is a risk of death or serious personal injury
CAUTION	Indicates there is a risk of burns, other personal injury, or property damage

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

	Attention	This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.	(Example) (Electric shock risk)
	Prohibited Action	This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.	(Example) (Do not disassemble)
	Mandatory Action	This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.	(Example) (Disconnect a plug)

(A label example used in this User's Guide)


Symbol to draw attention
Description of a warning
Term indicating a degree of danger
WARNING
Use only the specified outlet
Use a grounded outlet with the specified voltage. Use of an improper power source may cause a fire or a power leak.

Symbols used in this document and on warning labels

Attentions

	Indicates the presence of electric shock hazards.		Indicates the presence of mechanical parts that can result in bodily injury.
	Indicates the presence of a hot surface or component. Touching this surface could result in bodily injury.		Indicates the presence of mechanical parts that can result in pinching or other bodily injury.
	Indicates there is a risk of explosion.		Indicates the presence of laser beam that cause blindness.
	Indicates there is a risk of fire or fumes.		Indicates a general notice or warning that cannot be specifically identified.

Prohibited Actions

	Do not disassemble, repair, or modify the server. Otherwise, an electric shock or fire may be caused.		Do not touch the server with wet hand. Otherwise, an electric shock may be caused.
	Do not touch the component specified by this symbol. Otherwise, an electric shock or burn may be caused.		Do not use the server in the place where water or liquid may pour. Otherwise, an electric shock or fire may be caused.
	Do not place the server near the fire. Otherwise, a fire may be caused.		Indicates a general prohibited action that cannot be specifically identified.

Mandatory Actions

	Unplug the power cord of the server. Otherwise, an electric shock or fire may be caused.		Indicates a mandatory action that cannot be specifically identified. Make sure to follow the instruction.
	Make sure equipment is properly grounded. Otherwise, an electric shock or fire may be caused.		

Safety notes

This section provides notes on using the server safely. Read this section carefully to ensure proper and safe use of the server. For symbols, refer to *Safety precautions*.

General

WARNING

Do not use the server for services where human life may be at stake or high reliability is required.

This server is not intended for use in medical, nuclear, aerospace, mass transit or other applications where human life may be at stake or high reliability is required, nor is it intended for use in controlling such applications. We disclaim liability for any personal injury and property damages caused by such use of this server.

Do not use the server if any smoke, odor, or noise is present.

If smoke, odor, or noise is present, immediately turn off the server and disconnect the power plug from the outlet, then contact the store where you purchased the product or your maintenance service company. Using the server in such conditions may cause a fire.

Do not insert needles or metal objects.

Do not insert needles or metal objects into ventilation holes in the server or openings in the optical disk drive. Doing so may cause an electric shock.

CAUTION

Keep water or foreign matter away from the server.

Do not let any liquid such as water or foreign materials including pins or paper clips enter the server. Failure to follow this warning may cause an electric shock, a fire, or failure of the server. When such things accidentally enter the server, immediately turn off the power and disconnect the power plug from the outlet. Do not disassemble the server, and contact the store where you purchased the product or your maintenance service company.

Power supply and power cord use

⚠ WARNING

Do not hold the power plug with a wet hand.

Do not disconnect/connect the plug while your hands are wet. Failure to follow this warning may cause an electric shock.

Do not connect the ground wire to a gas pipe.

Never connect the ground wire to a gas pipe. Failure to follow this warning may cause a gas explosion.

⚠ CAUTION

Plug in to a proper power source.

Use a grounded outlet and observe the specified voltage. Use of an improper power source may cause a fire or a power leak.

Do not install the server where you need an extension cord. Use of a cord that does not meet the power specifications of the server may heat up the cord and cause a fire.

If you want to use an AC cord set with a ground wire of class OI, be sure to connect the ground wire before inserting the power plug into the outlet. Before disconnecting the ground wire, be sure to disconnect the power plug from the output.

Do not connect many cords into a single outlet by using extension cords.

The electric current exceeding the rated flow overheats the outlet, which may cause a fire.

Do not pull out a cable by gripping the cable part.

Pull a cable straight out by gripping the connector part. Pulling a cable by gripping the cable part or applying extra pressure to the connector part may damage the cable part, which may cause a fire or electric shock.

Insert the power plug into the outlet as far as it goes.

Heat generation resulting from a halfway inserted power plug (imperfect contact) may cause a fire. Heat will also be generated if condensation is formed on dusty blades of the halfway inserted plug, increasing the possibility of fire.

⚠ CAUTION

Do not use any unauthorized interface cable.

Use only the interface cables provided with the server. Electric current that exceeds the amount allowed could cause fire.

Also, observe the following precautions to prevent electrical shock or fire caused by a damaged power cord.

- Do not stretch the cord harness
- Do not bend the power cord.
- Do not twist the power cord
- Do not step on the power cord.
- Uncoil the power cord before use
- Do not secure the power cord with staples or equivalents
- Do not pinch the power cord
- Keep chemicals away from the power cord
- Do not place any object on the power cord
- Do not alter, modify, or repair the power cord
- Do not use a damaged power cord (replace the damaged power cord with a power cord of the same standard. For information on replacing the power cord, contact the store where you purchased the product or a maintenance service company)

Do not use the attached power cord for any other devices or usage.

The power cord that comes with your server is designed aiming to connect with this server and to use with the server, and its safety has been tested. Do not use the attached power cord for any other purpose. Doing so may cause a fire or an electric shock.

Installation, relocation, storage, and connection

⚠ CAUTION

Do not attempt to lift the server by holding the front bezel or air duct.

Securely hold the server by the base to move or lift. Do not attempt to lift it by holding the front bezel or air duct. Doing so may cause the front bezel or air duct to come off, which may cause not only breakage of the server but also cause the server to fall on to persons resulting in personal injury.

Do not install the server in any place other than specified.

Do not install the server in the following places or any place other than specified in this User's Guide. Failure to follow this instruction may cause a fire.

- A dusty place
- A humid place such as near a boiler
- A place exposed to direct sunlight
- An unstable place

Do not use the server in an environment where corrosive gas is present

Do not install the server in a place subject to corrosive gases including sodium chloride, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, or ozone. Do not install the server in an environment that contains dust, chemicals that accelerate corrosion such as NaCl or sulfur, or conductive materials. Failure to follow this warning may cause the wiring on the printed wiring board to short-circuit, leading to fire. If you have any questions, contact the store where you purchased the product or a maintenance service company.

Do not connect or disconnect any interface cable with the power cord of the server plugged to a power source.

Be sure to power off the server and unplug the power cord from a power outlet before installing/removing any optional internal device or connecting/disconnecting any interface cable to/from the server. If the server is off-powered but its power cord is plugged to a power source, touching an internal device, cable, or connector may cause an electric shock or a fire resulted from a short circuit.

Use only the specified interface cable.

Use only interface cables provided by NEC and locate a proper device and connector before connecting a cable. Using an authorized cable or connecting a cable to an improper destination may cause a short circuit, resulting in a fire.

Also, observe the following notes on using and connecting an interface cable.

- Do not use any damaged cable connector.
- Do not step on the cable.
- Do not place any object on the cable.
- Do not use the server with loose cable connections.
- Do not use any damaged cable.

Cleaning and working with internal devices

⚠ WARNING

Do not disassemble, repair, or alter the server.

Never attempt to disassemble, repair, or alter the server on any occasion except as described in this document. Failure to follow this warning may cause not only malfunction of the server but also an electric shock or fire.

Do not look into the optical disk drive

A laser beam used in the optical disk is harmful to the eyes. Do not look into or insert a mirror into the drive while the drive is powered on. If a laser beam (which is invisible) enters your eyes, you may lose your eyesight.

Do not attempt to remove lithium, NiMH, or Li-ion batteries.

The server contains the lithium, NiMH, or Li-ion battery (some optional devices have a lithium, NiMH, or Li-ion battery installed). Do not remove the battery. Placing a battery close to a fire or in the water may cause an explosion.

When the server does not operate appropriately due to the dead battery, contact the store you purchased the product or your maintenance service company. Do not attempt to disassemble the server to replace or recharge the battery by yourself.

⚠ CAUTION

High temperature

Components including internal Hard Disk Drives in the server are extremely hot just after the server is turned off. Allow the surface to cool before installing/removing.

Secure cables or cards in place

Be sure to secure the power cord, interface cables, and cards in place. Incomplete installation causes a loose connection, resulting in smoke or fire

During operation

CAUTION

Avoid contact with the server during thunderstorms.

Do not touch any part of the server including the cables when a thunderstorm is approaching. Also, do not connect or disconnect any devices. There may be a risk of electric shock from lightning strike.

Keep animals away from the server.

Keep animals such as pets away from the server. Pet hair or other waste enters the server, which may cause a fire or electric shock.

Do not place any object on top of vertically mounted servers.

Any weight on the server may cause the server to fall, resulting in personal injury or property damage.

Do not place any object that weighs 5 kg or more on top of horizontally mounted servers.

The maximum weight that can be placed on top of the server when it is horizontally mounted is 5 kg. Do not place any object weighing 5 kg or more on top of the server. Failure to observe this limit may deform the server, which could cause a failure.

Do not leave the optical disk drive tray open.

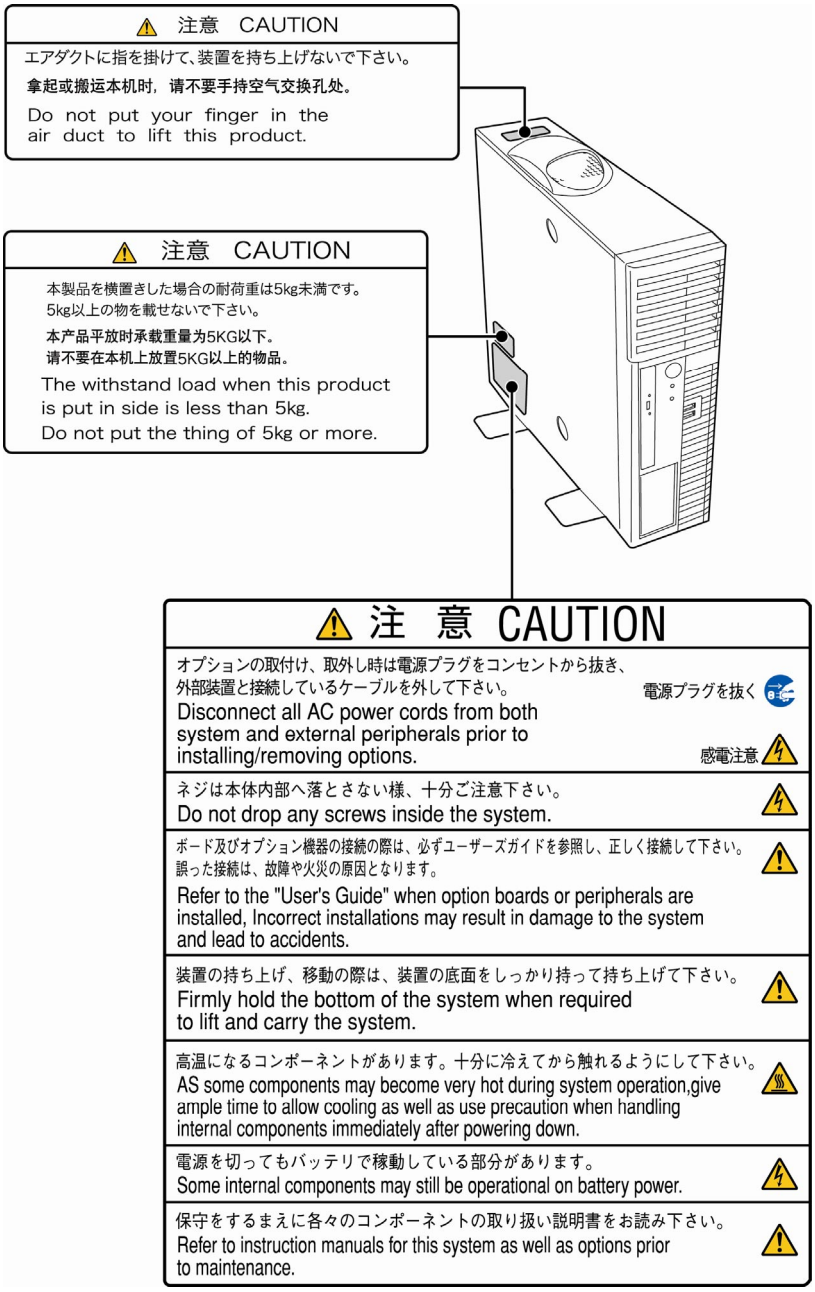
Dust may get in the server when the tray is open, which may result in a malfunction. In addition, bumping the open tray could cause personal injury.

Do not get yourself caught in the fan

Keep your hands and hair away from the cooling fan at the rear of the server during operation. Failure to observe this warning may cause your hands or hair to catch in the fan, resulting in personal injury.

Warning labels

Warning label are attached on or near the components with potential hazards (This label is either attached or printed on the component.) to draw attention from users to potential hazards involved in handling the server. (Do not remove or black out this label and keep it clean). If no label is attached or printed on the server, or if there is a label coming off or stained, contact the store where you purchased the product.


⚠ 注意 CAUTION
エアダクトに指を掛けて、装置を持ち上げないで下さい。
拿起或搬运本机时，请不要手持空气交换孔处。
Do not put your finger in the air duct to lift this product.
⚠ 注意 CAUTION
本製品を横置きした場合の耐荷重は5kg未満です。
5kg以上の物を載せないで下さい。
本产品平放时承载重量为5KG以下。
请不要在本机上放置5KG以上的物品。
The withstand load when this product is put in side is less than 5kg.
Do not put the thing of 5kg or more.
⚠ 注 意 CAUTION
オプションの取付け、取外し時は電源プラグをコンセントから抜き、外部装置と接続しているケーブルを外して下さい。
電源プラグを抜く
Disconnect all AC power cords from both system and external peripherals prior to installing/removing options.
感電注意
ネジは本体内部へ落とさない様、十分ご注意下さい。
Do not drop any screws inside the system.
ボード及びオプション機器の接続の際は、必ずユーザーズガイドを参照し、正しく接続して下さい。誤った接続は、故障や火災の原因となります。
Refer to the "User's Guide" when option boards or peripherals are installed, Incorrect installations may result in damage to the system and lead to accidents.
装置の持ち上げ、移動の際は、装置の底面をしっかり持って持ち上げて下さい。
Firmly hold the bottom of the system when required to lift and carry the system.
高温になるコンポーネントがあります。十分に冷えてから触れるようにして下さい。
AS some components may become very hot during system operation,give ample time to allow cooling as well as use precaution when handling internal components immediately after powering down.
電源を切ってもバッテリで稼動している部分があります。
Some internal components may still be operational on battery power.
保守をするまえに各々のコンポーネントの取り扱い説明書をお読み下さい。
Refer to instruction manuals for this system as well as options prior to maintenance.

Handling precautions (for proper operations)

Be sure to observe the following precautions for the proper functioning of the server. Ignoring the precautions may cause server malfunction or failure.

- **Do not use any cell phone or PHS and switch off them near the server. Electric waves from such devices can cause server to malfunction.**
- **Install the server in an appropriate place. For details about the installation location, refer to *Chapter 2 Preparations (2. Installation and Connection)*.**
- **Before connecting/removing cables to/from peripheral devices, make sure that the server is off and unplug the power cord.**
- **Connect the provided power cord to a 100 VAC outlet. If an optional cable is used, you may connect to a 100 or 200 VAC power system.**
- **Make sure that the access LED on the server is off before turning off the power or ejecting an optical disk.**
- **Wait for at least 30 seconds before turning on the server after turning off the server. If any Uninterruptible Power Supply unit is connected, set it to wait for at least 30 seconds before turning on the server after power off.**
- **Turn off the server and unplug the power cord before moving it.**
- **Regularly clean the server to prevent various types of failure. (Refer to *Chapter 1 Maintenance (2. Daily Maintenance)* in "*Maintenance Guide*" for details about cleaning.)**
- **Momentary voltage drop may occur due to lightning strike. To prevent this, use of UPS is recommended.**
- **We do not guarantee that any copy-protected CD that does not conform to standards will play on the CD player.**
- **Make sure that optional devices you are going to install are supported for use with the server. Even if they are successfully installed or connected, installation of unsupported devices can cause the server to malfunction or even failure.**
- **In the following cases, check and adjust the system clock before operation.**
  - After transportation
  - After storage
  - After the server is used following a period of disuse, in which storage conditions did not conform to those that guarantee server operations (temperature: 10°C to 40°C; humidity: 20% to 80%).
    Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if high accuracy timing is required by the system.
    If you notice that the system clock runs significantly faster or slower over time even after adjustment, contact the store where you purchased the product or your maintenance service company for repair.
- **In order to get the server and internal devices to work properly, we recommend you store the server at room temperature.**
  Observe the storage conditions (Temperature: –10°C to 55°C, Humidity: 20% to 80%) to store the server. (No condensation of moisture)

- **If this server, internal optional devices, and media set for the backup devices (tape cartridges) are moved from a cold place to a warm place in a short time, condensation will occur and cause malfunctions and failures when these are used in such state. To protect important stored data and property, make sure to wait for a sufficient period to use the server and components in the operating environment.**
  Reference: Time effective at avoiding condensation in winter (10°C or more differences between the room temperature and atmospheric temperature)
  Disk devices: Approximately 2 to 3 hours
  Tape media: Approximately 1 day
- **For optional devices, we recommend you use our NEC products. Some memory or Hard Disk Drive manufactured by other companies are supported for use with this server, however, you will be charged to repair failure or damage caused by use of such products even within warranty period.**

Tips

Maintenance service
We offer periodic diagnosis and maintenance services by staff with expert knowledge of the maintenance of this server.
We recommend that you make a periodic maintenance service contract with your maintenance service company to keep your server in good condition.

Tips for your health and safety

Using a computer extensively may affect different parts of your body. Here are tips you should follow while working on a computer to minimize strain on your body.

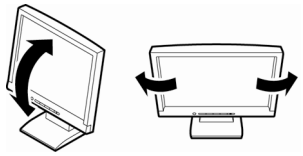
Keep proper posture

The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when your muscles are most relaxed.

Working on the computer with bad posture such as hunching over or being too close to the monitor could cause fatigue or deteriorated eyesight.

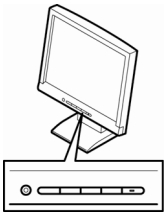
Adjust the angle of your display

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. Working without adjusting the display to a comfortable angle makes it difficult for you to maintain a proper posture and you will get tired easily. Adjust the viewing angle before use.



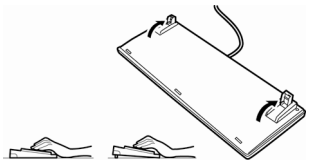
Adjust the brightness and contrast of the display

Display screens have functions to control brightness and contrast. The most suitable brightness/contrast depends on age, individuals, and environment, so adjust it to suit your preferences. A too bright or too dark display is bad for your eyes.



Adjust the angle of keyboard

Some keyboards are ergonomically designed, which allow the angle to be adjusted. Adjusting the angle of the keyboard is effective to reduce tension on your shoulders, arms, and fingers.



Clean your equipment

Keeping your equipment clean is important not only for the appearance but also for functional and safety reasons. A dusty monitor makes it difficult to see the display contents, so clean it regularly.

Take rest breaks

When you feel tired, take a break. Light exercise is also recommended.

NEC Express5800 Series
Express5800/GT110d-S

1 General Description

This chapter introduces the features of this server and the name of each part.

1. **Introduction**

2. **Accessories**
   Verify the condition of your server's accessories.

3. **Standard Features**
   Check and maintain the server system by using the functions explained in this section.

4. **Names and Functions of Parts**
   This section describes the name of each part contained in this server.

.

1. Introduction

Thank you for purchasing this NEC Express5800 Series product.
This high performance server is powered by the latest Intel® processor. The type of processor installed depends on the model.

- **Intel® Xeon® processor**
- **Intel® Pentium® processor**
- **Intel® Core™ i3 processor**

NEC's latest technology and architectures realize high-power and high-speed operation that cannot be matched by existing servers.
The server is designed with consideration of not only reliability but also expandability, which enables you to use it as a network server.
Read this document before using the server thoroughly to fully understand handling of the NEC Express server and appreciate its functions to the maximum extent.

2. Accessories

The carton box contains various accessories which are required for setup or maintenance. **Make sure you have them all** for future use.

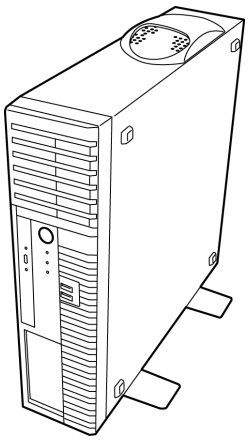
- SATA cable × 2[*1]
- Keyboard × 1
- Mouse × 1
- Air duct × 1
- Rubber foot × 4
- Security key × 2[*2]
- Screw (503) × 1[*3]
- Screw (505) × 2[*1]
- EXPRESSBUILDER[*4]
- Getting Started
- Power cord x 1

*1 Only for 3.5-inch disk models. The number of the cable depends on the Hard Disk Drive configuration.
*2 Only for 2.5-inch disk models.
*3 If an internal backup device is pre-installed, this is already attached.
*4 Documents are stored in EXPRESSBUILDER. Adobe Reader is required to read the documents so make sure you have it installed in your PC.

Make sure you have all accessories and inspect them. If an accessory is missing or damaged, contact your sales representative.

3. Standard Features

The server has the following standard features:



High performance
- Intel® Xeon®/Pentium®/Core™ i3 processor
- High-speed memory access (DDR3 1333 supported)*
- High-speed disk access (SATA2 3 Gbps, SAS 6 Gbps supported)
- High-speed 1000BASE-T/100BASE-TX/10BASE-T (2 ports) interface (1 Gbps/100 Mbps/10 Mbps supported)

*: Pentium G620 embedded models operate at 1066 MHz.

High reliability
- Memory monitoring feature (error correction/error detection)
- Memory degeneracy feature (logical isolation of a failed device)
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- RAID System (Disk Array) (also available as an option)
- BIOS password feature

Management utilities
- NEC ESMPRO
- ExpressUpdate
- Remote controlling featuer (EXPRESSSCOPE Engine 3)
- RAID System management utility (Universal RAID Utility)
- Hard Disk Drive monitoring

Power saving and noiseless design
- Power monitoring feature
- Power control feature
- High-efficiency power supply supporting 80 PLUS® Silver
- Fan control appropriate to environment, work load, and configuration
- Enhanced Intel SpeedStep® Technology supported

Expandability
- Many IO option slots
  - PCI Express 2.0 (x 16 lanes): 1 slot
  - PCI Express 2.0 (x 4 lanes): 2 slots
  - PCI (32 bits/33 MHz): 1 slot

  * For water-cooled models, 1 slot of PCI Express 2.0 (4 lanes) and PCI (32 bits/33 MHz) slot cannot be used.
- Large memory of up to 32 GB
- Backup device bay provided as standard
- USB2.0 interface
- Three LAN ports (one for management LAN)

Ready to use
- Hard Disk Drives can be installed with one-touch setup, which requires no cables (hot swap supported)

Many built-in features

- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Remote console feature
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

Self-diagnosis

- Power On Self-Test (POST)
- Test and Diagnosis (T&D) utility

Easy setup

- EXPRESSBUILDER (setup utility)
- SETUP (BIOS SETUP utility)

Maintenance features

- Off-line maintenance utility
- Memory dump feature using the DUMP switch
- Feature to back up and restore BIOS/BMC settings using the EXPRESSSCOPE profile key

3.1 Management Features

The hardware components of the server provide operation control/reliability features as shown below. Additionally, *NEC ESMPRO Agent*, which is provided in EXPRESSBUILDER, enables you to collectively manage the state of your systems. You can also monitor the server states from a PC to manage the network where NEC ESMPRO Manager provided in EXPRESSBUILDER is installed.

The features available on this server are as shown in the table below.

Function		Availability	Description
Hardware			Shows physical hardware information.
	Memory bank	○	Shows physical memory information.
	Device info	○	Shows information specific to the server.
	CPU	○	Shows physical CPU information.
System		○	Shows logical CPU information and monitors the load factor. Shows logical memory information and monitors the status.
I/O device		○	Shows information on I/O devices (serial ports, keyboard, mouse, and video).
System environment			
	Temperature	○	Monitors the temperature inside of the chassis.
	Fan	○	Monitors the fans.
	Voltage	○	Monitors the voltage inside of the chassis.
	Power supply	○	Monitors the power supply unit.
	Door	×	Monitors chassis intrusion (open/close of the covers and doors on the chassis).
Software		○	Shows service, driver, and OS information.
Network		○	Shows network (LAN) information and monitors packets.
BIOS		○	Shows BIOS information.
Local polling		○	Monitors the values of an MIB item obtained by NEC ESMPRO Agent.
Storage		○	Monitors controllers and storage devices including Hard Disk Drives.
File system		○	Shows the file system configuration and monitors the free space.
RAID System/Disk Array		○	Monitors the following RAID Controllers: • On-board RAID Controller (LSI Embedded MegaRAID™) • Optional RAID Controller N8103-128/129/130/134
Others*		○	Monitors OS stall using the Watch Dog Timer.
		○	Performs alert processing after an OS STOP error occurs.

○: Supported. △: Partially supported. ×: Unsupported.

*: Not displayed on the NEC ESMPRO Manager screen.

Tips NEC ESMPRO Manager and NEC ESMPRO Agent are supplied with the server as standard. For how to install and use each software component, refer to the explanation of the component.

3.2 Firmware and Software Version Management

By using NEC ESMPRO Manager and ExpressUpdate Agent, you can manage firmware or software on the server and update them by applying an update package.

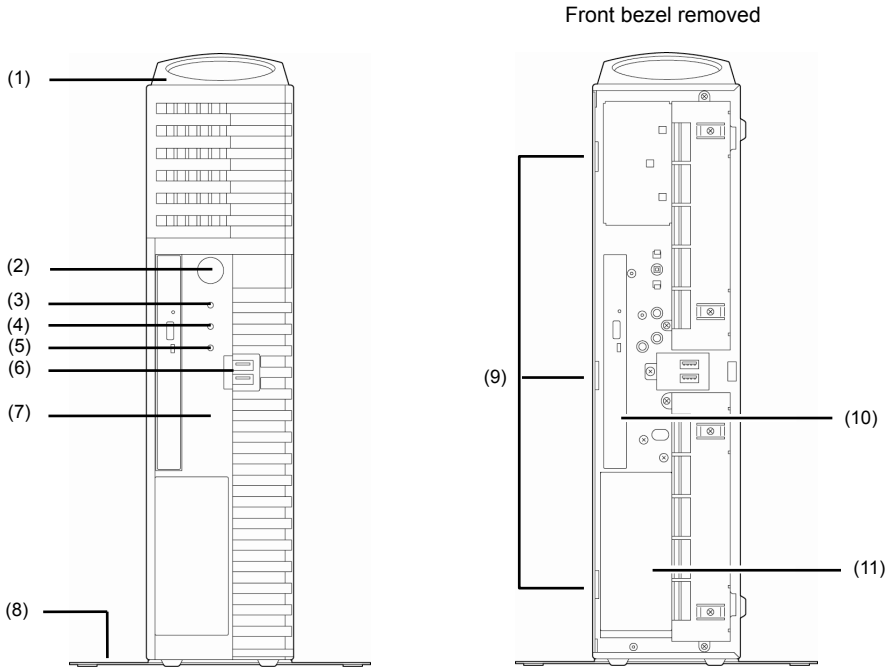
This function automatically updates multiple modules without stopping the system just by specifying the application of an update package from NEC ESMPRO Manager.

4. Names and Functions of Parts

Names and functions of parts are as follows.

4.1 Front of the server

3.5-inch Hard Disk Drive model



(1) Air duct
To take air to cool the server

(2) POWER switch
The switch to turn the server on and off. Press once to turn on the server. The LED lights green when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off the server.

(3) Power LED (green)
This LED lights green when the power is ON.

(4) Disk access LED (green/amber)
This LED lights or flashes green when the internal Hard Disk Drive is being accessed.

(5) Status LED (green/amber)
This LED indicates the server status. It lights green when the server is operating normally.

(6) Front USB connectors
These connectors are used to connect devices that support the USB interface.

(7) Front bezel
This cover protects the front part of the server. Remove this to handle 3.5-inch device and Hard Disk Drives.

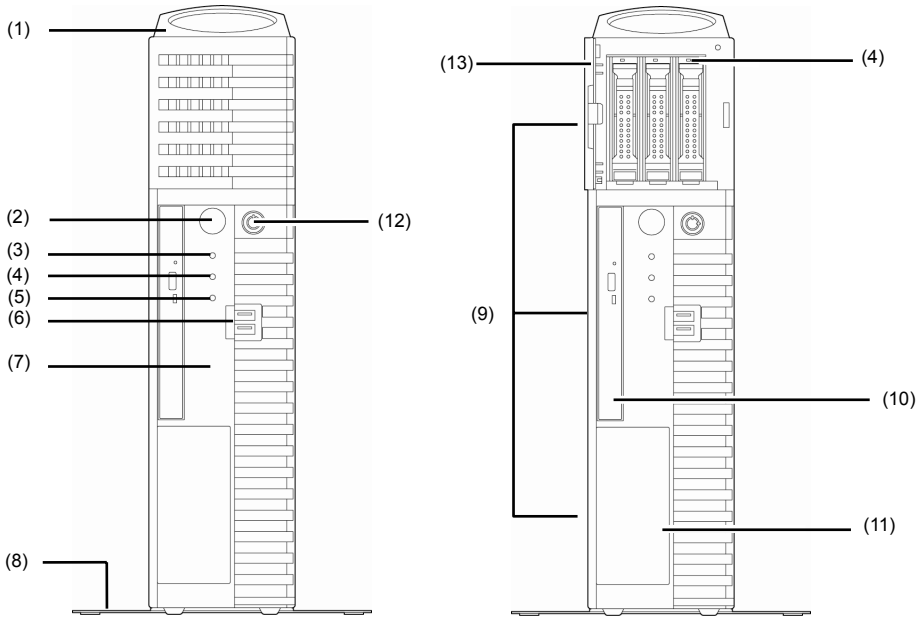
(8) Stabilizer
To mount the server vertically, install as shown in the image

(9) Release tabs (3 at side of front bezel)
Tabs to unlock the front bezel. Pull up to disengage the front bezel.

(10) Optical disk drive
Reads data from (or writes data to) the disk.
The drive provides the following: an eject button to eject the tray; an LED that indicates Hard Disk Drive access; and an eject hole for forcibly ejecting the tray

(11) 3.5-inch device bay
The bay which can accommodate 3.5-inch device.

2.5-inch Hard Disk Drive model



(1) Air duct
To take air to cool the server

(2) POWER switch
The switch to turn the server on and off. Press once to turn on the server. The Power LED lights green when it is on. Press it again to turn off the server. Hold down the switch for 4 seconds or more to forcibly turn off, the server.

(3) Power LED (green/amber)
This LED lights green when the power is ON.

(4) Disk access LED (green/amber)
This LED lights or flashes green when the internal Hard Disk Drive is being accessed. It lights amber when the drive is broken and flashes amber and green alternately when the array disk is being rebuilt.

(5) Status LED (green/amber)
This LED indicates the server status. It lights green when the server is operating normally and lights or flashes amber when errors occur.

(6) Front USB connectors
These connectors are used to connect devices that support the USB interface.

(7) Front bezel
This cover protects the front part of the server.

(8) Stabilizer
To mount the server vertically, install as shown in the image

(9) Release tabs (3 at side of front bezel)
Tabs to unlock the front bezel. Pull up to disengage the front bezel.

(10) Optical disk drive
Reads data from (or writes data to) the disk.
The drive provides the following: an eject button to eject the tray; an LED that indicates Hard Disk Drive access; and an eject hole for forcibly ejecting the tray.

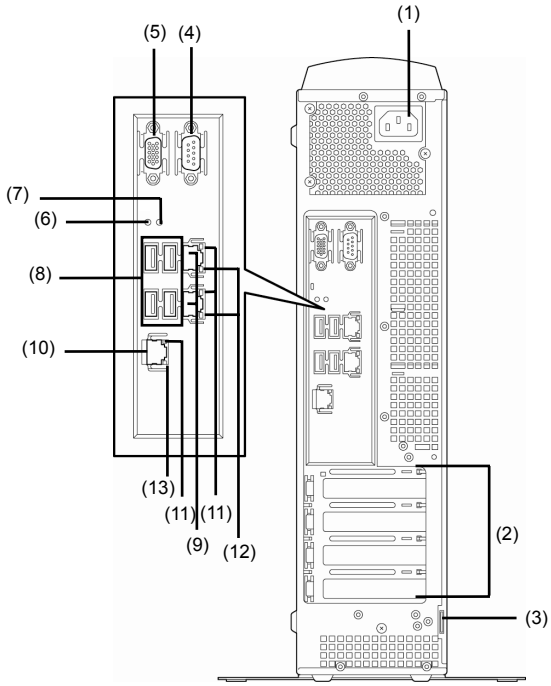
(11) 3.5-inch device bay
The bay which can accommodate 3.5-inch device or extra HDD cage.

(12) Security key
Locks the door of 2.5-inch Hard Disk Drive bays

(13) 2.5-inch Hard Disk Drive bay door
Open this door to handle 2.5-inch Hard Disk Drives. This door can be locked with the security key.

4.2 Rear view

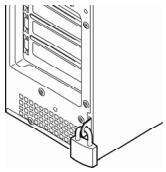
3.5-inch Hard Disk Drive model and 2.5-inch Hard Disk Drive model



(1) AC inlet
This socket is used to connect the power cord.

(2) PCI slots

(3) Chassis lock
The lock is provided to protect internal components from theft.



(4) Serial port A connector
This connector is used to connect devices that support a serial interface. Note that it is not possible to directly connect to a dedicated line. If the N8117-01A additional RS232C connector kit (available as an option), is connected, the connector at N8117-01A will be the serial port B connector.

(5) Monitor connector
The connector to connect the monitor

(6) DUMP switch
Press this switch to obtain a memory dump.

(7) BMC RESET switch (M RESET)
The switch to reset BMC of this server. Use the switch only when there is something wrong with EXPRESSSCOPE Engine 3 (BMC).

(8) USB connectors
These connectors are used to connect devices that support the USB interface.

(9) LAN connectors
1000BASE-T/100BASE-TX/10BASE-T supported Ethernet connectors to connect to network system over LAN

(10) Management LAN port
An Ethernet connector which supports 100BASE-TX. This port is used for connection with EXPRESSSCOPE Engine 3, and cannot be used as a data transmission port.

(11) LINK/ACT LED (green)
The LED indicates the access status of LAN

(12) Speed LED (green/amber)
The LED indicates the transfer speed of LAN ports

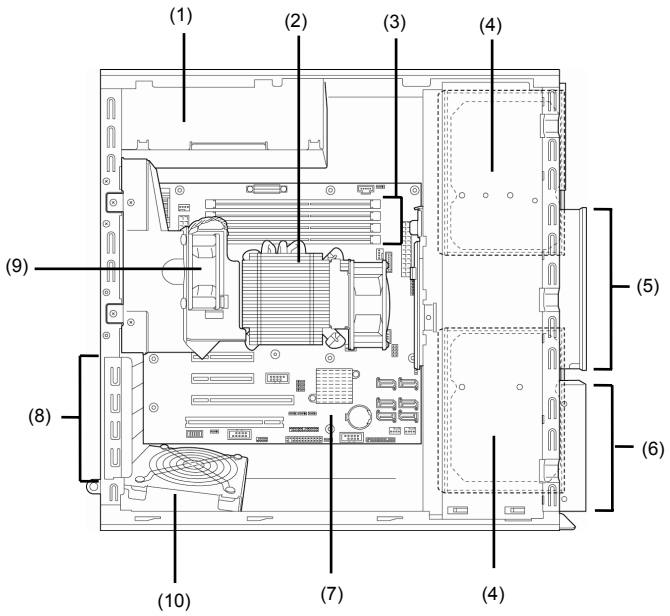
(13) Speed LED (green)
The LED indicates the transfer speed of the LAN port used for management

Important **Consult with the service technician of your maintenance service company to control DUMP switch. If you control the switch while it is working fine, the system will stop.**

Tips N8117-01A additional RS-232C connector kit can be installed on air-cooled models only.

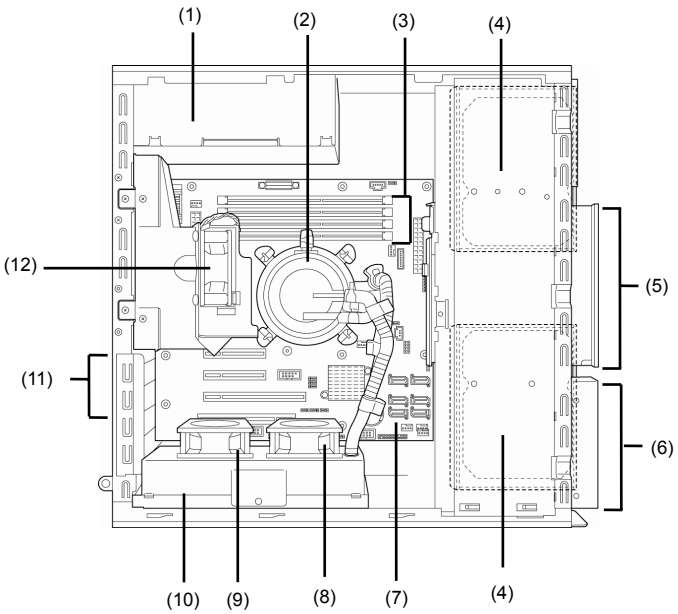
4.3 Internal view

3.5-inch Hard Disk Drive model, air-cooled type



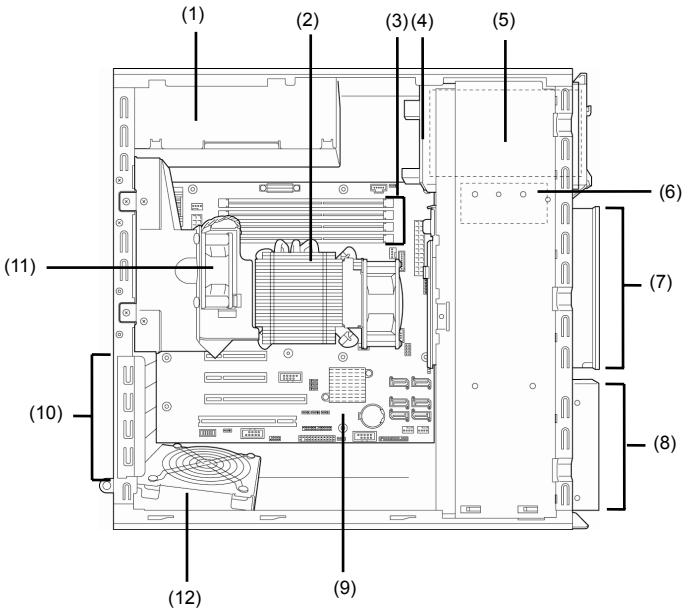
(1) Power supply unit
(2) CPU cooling fan
(3) DIMM slots
(4) 3.5-inch Hard Disk Drive
(5) Optical disk drive
(6) 3.5-inch device bay
(5) Motherboard
(8) PCI slot
(9) Rear fan
(10) Bottom fan

3.5-inch Hard Disk Drive model, water-cooled type



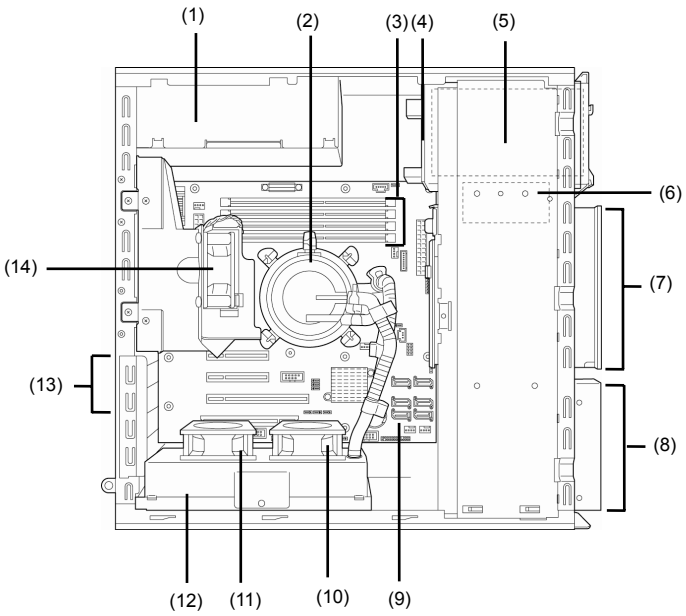
(1) Power supply unit
(2) Water cooling unit (for cooling CPU)
(3) DIMM slots
(4) 3.5-inch Hard Disk Drive
(5) Optical disk drive
(6) 3.5-inch device bay
(7) Motherboard
(8) Radiator cooling fan (front)
(9) Radiator cooling fan (rear)
(10) Radiator
(11) PCI slots
(12) Rear fan

2.5-inch Hard Disk Drive model, air-cooled type



(1) Power supply unit
(2) CPU cooling fan
(3) DIMM slot
(4) SAS backplane
(5) 2.5-inch Hard Disk Drive
(6) HDD fan
(7) Optical disk drive
(8) 3.5-inch device bay
(9) Motherboard
(10) PCI slot
(11) Rear fan
(12) Bottom fan

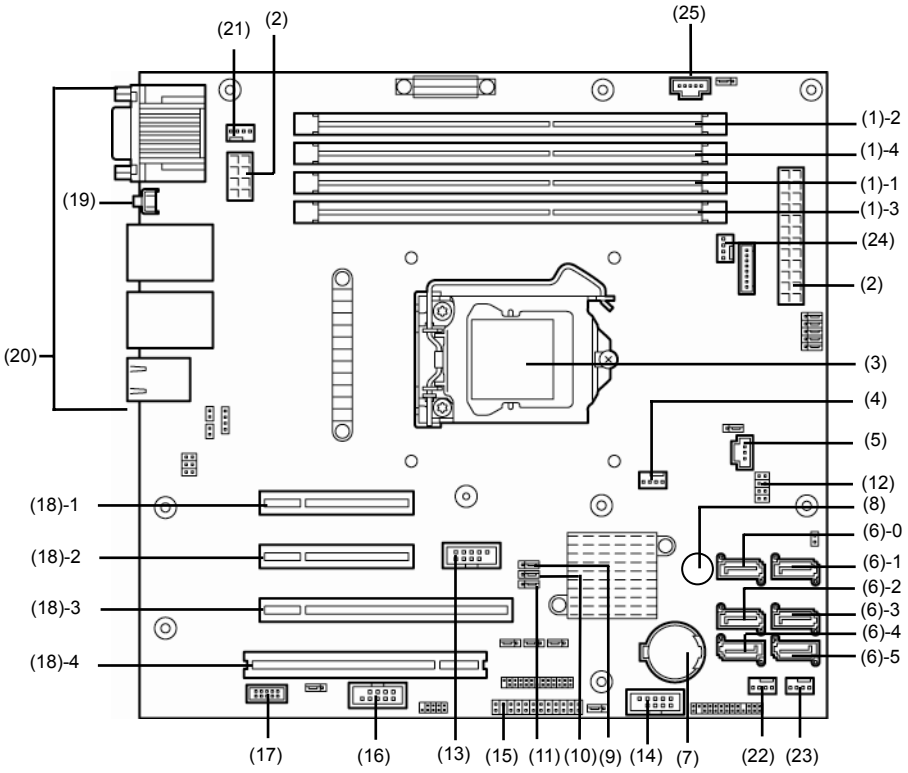
2.5-inch Hard Disk Drive model, water-cooled type



(1) Power supply unit
(2) CPU cooling fan (for cooling CPU)
(3) DIMM slot
(4) SAS backplane
(5) 2.5-inch Hard Disk Drive
(6) HDD fan
(7) Optical disk drive
(8) 3.5-inch device bay
(9) Motherboard
(10) Radiator cooling fan (front)
(11) Radiator cooling fan (rear)
(12) Radiator
(13) PCI slot
(14) Rear fan

4.4 Motherboard

3.5-inch Hard Disk Drive model, 2.5-inch Hard Disk Drive model



(1) DIMM slots (the number after hyphen indicates DIMM number)

(2) Power connector

(3) CPU socket

(4) CPU cooling fan connector

(5) RAID LED cable connector

(6) Serial ATA connector (the number after hyphen indicates connector number)

(7) Lithium battery

(8) Buzzer

(9) CMOS configuration jumper switch

(10) RAID switch jumper

(11) Password clear jumper

(12) SGPIO connector

(13) Internal Flash Memory connector

(14) USB connector (for front)

(15) LED/SW connector

(16) COM B connector (for N8117-01A)

(17) SPI Flash Mezzanine connector

EXPRESSSCOPE profile key (SPI flash memory) has been installed, where BIOS and BMC configuration data is stored. Move it when replacing MB to keep using the data.

(18) PCI card slots

(18)-1 PCI EXPRESS x4 (x8 connector)
(18)-2 PCI EXPRESS x4 (x8 connector)
(18)-3 PCI EXPRESS x16*
(18)-4 PCI 32 bits/33 MHz*

* Not available for water-cooled models.

(19) (Lower) DUMP switch (NMI)
(Upper) BMC RESET(M RESET) switch

(20) External connector

(21) Fan 2 connector (for rear fan)

(22) Fan 3 connector (for bottom fan/radiator rear fan)

(23) Fan 4 connector (for additional 2.5-inch HDD cage fan/radiator front fan)

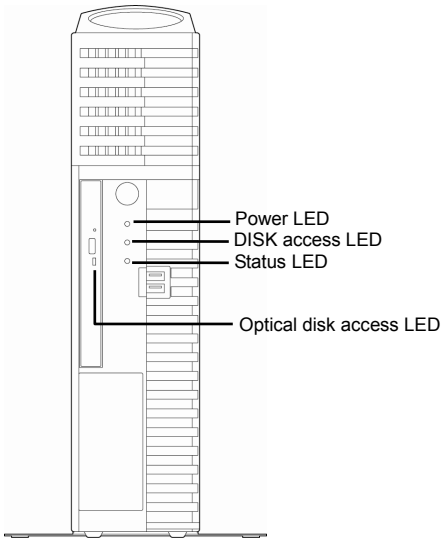
(24) Fan 5 connector (for 2.5-inch HDD cage)

(25) PM-BUS connector

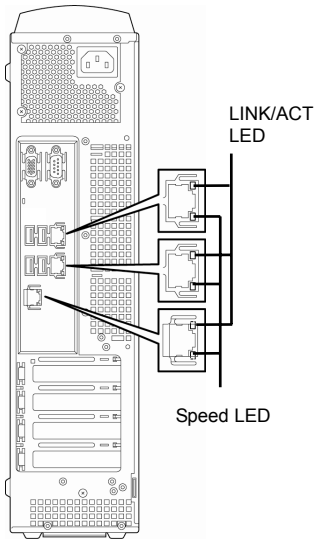
4.5 Status Indicators

This section explains the indication and meanings of the server LEDs.

3.5-inch Hard Disk Drive model

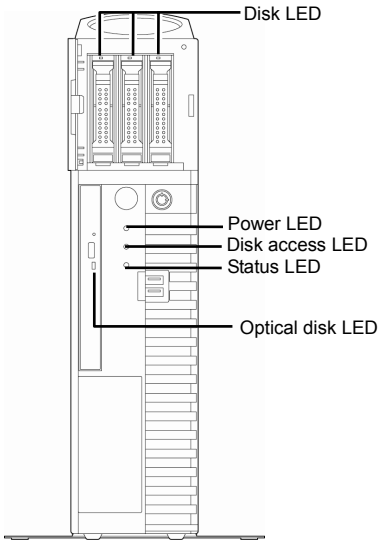


Front view

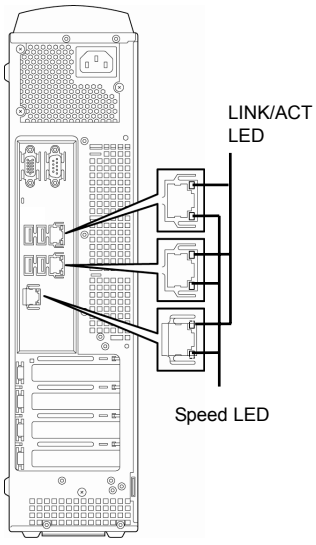


Rear view

2.5-inch Hard Disk Drive model



Front view



Rear view

4.5.1 Power LED ( )

The power LED lights green while the server is on.

4.5.2 Status LED (⚠)

While hardware is operating normally, the status LED lights green. The status LED is off or lights/flashes amber if there is a problem with hardware.

The following table lists status LED patterns, their explanation and solution.

Tips Refer to the system event log (SEL) by using ESMPRO or the offline maintenance utility to view the cause of failure.
If shutdown processing can be performed via the operating system when you want to restart the system after turning the power off, restart the system by performing shutdown processing. If shutdown processing cannot be performed, restart the system by resetting the system, forcibly turning the power off or disconnecting and then connecting the power cord.

Status LED pattern	Explanation	Solution
On (green)	The server is operating normally.	–
Flashing (green)	The server is operating with the memory in degraded state.	Identify the device in degraded state by using the BIOS setup utility *SETUP*, and replace it as soon as possible.
	An uncorrectable memory error has often occurred.	
Off	The power is off.	Turn on the server.
	POST is in progress.	Wait for a while. The STATUS LED will turn green after POST completes.
	A CPU error occurred.	Turn the power off and then turn it on. If the POST screen displays any error message, take notes of the message, and contact your maintenance service company.
	Abnormal CPU temperature is detected.	
	Watchdog timer expired.	
	An uncorrectable error in memory is detected.	
	A PCI system error occurred	
	A PCI parity error occurred	
	A PCI bus error occurred.	
	Memory dump is being requested. (e.g. when DUMP switch NMI is pressed) **Note** It remains green if the dump is caused by software.	Wait until the memory dump is completed.
On (amber)	A temperature alarm was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change when the fans are normal, contact your maintenance service company.
	A voltage alarm was detected.	Contact your maintenance service company.
	A CPU temperature alarm was detected.	
	SMI timeout is detected	

Status LED pattern	Explanation	Solution
Flashing (amber)	Failure of the power supply unit is detected	Connect the power cord to supply power. If the power supply unit is faulty, contact your maintenance service company.
	A fan alarm was detected.	Check if the internal fan cable is properly connected. If the LED indication does not change when the fans are normal, contact your maintenance service company.
	A temperature warning was detected.	Check the internal fan for dusts. Also check if the fan unit is properly connected. If the LED indication does not change when the fans are normal, contact your maintenance service company.
	A voltage warning was detected	Contact your maintenance service company.
	An error was detected on either of the Hard Disk Drives.	
	An error is detected with Node Manager	

4.5.3 Disk access LED ( )

The disk access LED lights or flashes green when an internal Hard Disk Drive or the optical disk drive is being accessed. If a 2.5-inch Hard Disk Drive model is used in RAID System by using an optional RAID Controller, the LED lights amber and green alternately when the Hard Disk Drive failed and flashes when it is being rebuilt.

Tips For 3.5-inch Hard Disk Drive model, the LED does not light/flashes amber when Hard Disk Drive is broken or being rebuilt.

4.5.4 Optical disk access LED

The ACCESS LED lights/flashes when the media set on the optical disk drive is being accessed.

4.5.5 Disk LED

For 2.5-inch Hard Disk Drive model, each drive has its respective LED. When the Hard Disk Drive is accessed, the LED lights/flashes green. In RAID System, when a Hard Disk Drive failed, the LED lights amber and then flashes amber when it is being rebuilt.

4.5.6 LINK/ACT LED (1, 2, M)

This LED indicates the state of the standard network port. If the server and HUB is supplied with power and connected properly, the LED is on (LINK). If the network port is transmitting/receiving data, the LED flashes (ACT).

If the LED does not turn on in LINK state, check the cable or connection. If the LED remains off, the network (LAN) controller may be defective. Contact the store where you purchased the product or your maintenance service company.

4.5.7 Speed LED (1, 2, M)

This LED indicates which network interface is used.

– The two LAN connectors for data transmission support 1000BASE-T, 100BASE-TX, and 10BASE-T and the LED indicates which network interface is being used.
  - Amber: Operating with 1000BASE-T
  - Green: Operating with 100BASE-TX
  - OFF: Operating with 10BASE-T

– The LAN connector used for management supports 100BASE-TX and the LED flashes green during the operation.

NEC Express5800 Series
Express5800/GT110d-S

2 Preparations

This chapter describes preparations for using this server.

1. **Installing Internal Optional Devices**

   You can skip this section if you did not purchase any optional devices.

2. **Ideal Location and Connection**

   You must place the server in an ideal location and connect some cables following this section.

1. Installing Internal Optional Devices

This chapter describes the instructions for installing supported optional devices and precautions. If you did not purchase any optional device requiring installation, you may skip this section.

Important

- **We recommend that optional devices be installed by a maintenance service staff from your maintenance service company, who has specialized knowledge of this server.**
- **Use only the devices and cables specified by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.**

1.1 Safety Precautions

Be sure to observe the following precautions to install and remove optional devices properly and safely.

⚠ WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not disassemble, repair, or modify the server.**
- **Do not remove the lithium, NiMH, or Li-ion battery.**
- **Do not handle the server while the power plug is inserted into the outlet.**

⚠ CAUTION

Be sure to observe the following precautions to use of the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not attempt to lift the server by gripping the front bezel or air duct.**
- **Make sure to complete installation.**
- **Do not get your fingers caught.**
- **High temperature.**

1.2 Anti-static Measures

The server contains electronic components sensitive to static electricity. Avoid failures caused by static electricity when installing or removing any optional devices.

- **Wear a wrist strap (an arm belt or anti-static glove)**

  Wear a wrist strap on your wrist. If no wrist strap is available, touch an unpainted metal part of the cabinet before touching a component to discharge static electricity from your body.

  Also discharge static electricity by periodically touching a metal surface while working on the components.

- **Select a suitable work space**
  - Work with the server on the anti-static or concrete floor.
  - When you work with the server on a carpet where static electricity is likely to be generated, be sure to take anti-static measures beforehand.
- **Use a work table**

  Place the server on an anti-static mat to work with.

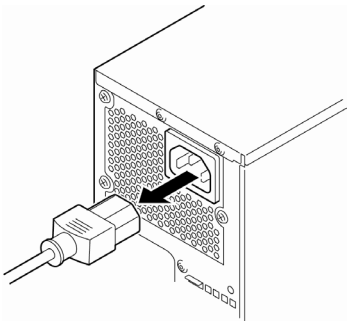
- **Clothing**
  - Do not wear wool or synthetic clothes.
  - Wear anti-static shoes.
  - Take off any jewels (a ring, bracelet, or wrist watch) before working with the server.
- **Handling of components**
  - Keep any component in an anti-static bag until you actually install it to the server.
  - Hold any component by its edge to avoid touching any terminals or parts.
  - To store or carry any component, place it in an anti-static bag.

1.3 Overview of Installation and Removal

Install/remove components by using the following procedure.

1. If the server is ON, turn it off.
   Refer to Chapter 3 (6. *Turning Off the Server*).

2. Disconnect the power cord from the outlet and the server.



3. Disconnect all cables connected to the connector at the rear.

4. Remove the side cover.
   Refer to *Chapter 2 (1.4. Removing the Side Cover)*.

5. Remove the front bezel if applicable.
   Refer to *Chapter 2 (1.5 Removing the Front Bezel)*.

6. Depending on the components to be installed or removed, follow the procedure in order.
   Refer to *Chapter 2* (*1.6 Internal Flash Memory)* to *(1.14 Backup devices)*.

7. Connect cables
   Refer to *Chapter 2* (*1.15 Connecting cables)*.

8. Attach the front bezel.
   Refer to *Chapter 2 (1.16 Attaching the Front Bezel)*.

9. Attach the side cover.
   Refer to *Chapter 2* (*1.17 Installing the Side Cover)*.

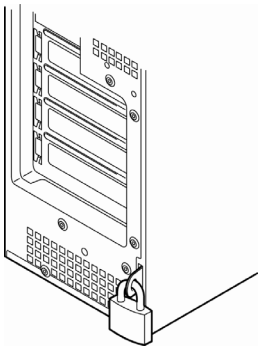
This is the end of the installation or removal procedures for internal optional devices.

Continue the setup with reference to *Chapter 2 (2.2 Connection)*.

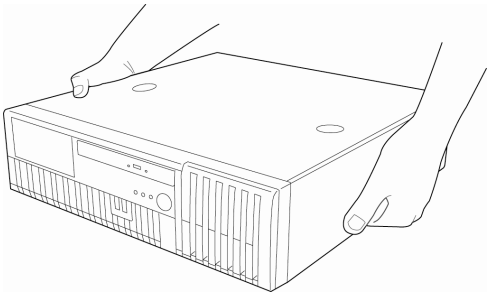
1.4 Removing the Side Cover

Remove the side cover by using the following procedure.

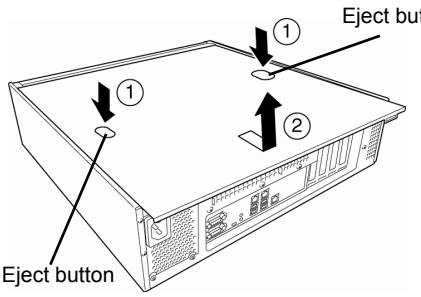
1. Refer to steps 1 to 3 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Unlock the padlock attached to the chassis if applicable.

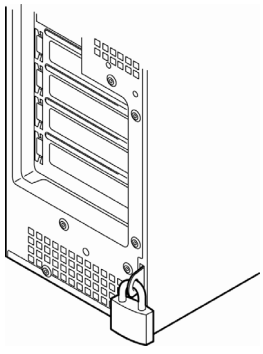


3. Lay it so that the side cover faces upward. Lay it down slowly and gently.



4. Remove the side cover. While pressing the two eject buttons, slide the cover backward and lift it off.





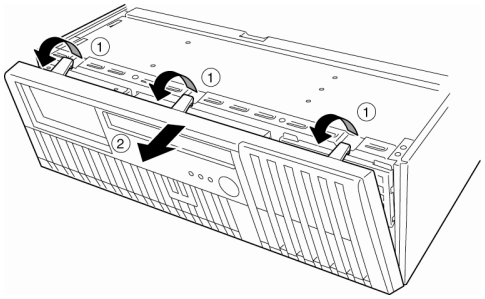
Important **BRACKET KEY: This equipment is intended for installation in a location with restricted access.**

- **Access can only be gained by service persons or by users who have been instructed about the reasons for the restrictions applied to the location and about any precautions to be taken.**
- **Access can be obtained through the use of a special tool or lock and key, or other means of security. This tool is controlled by the authority responsible for the location.**

1.5 Removing the Front Bezel

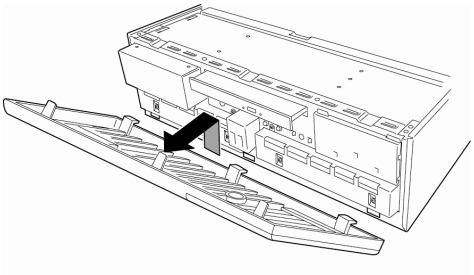
Remove the front bezel by using the following procedure.

1. Refer to steps 1 to 3 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Release the three release tabs on the front bezel (①) in the direction of the arrow shown in the image and then pull the front bezel forward slightly until it comes off the frame (②).



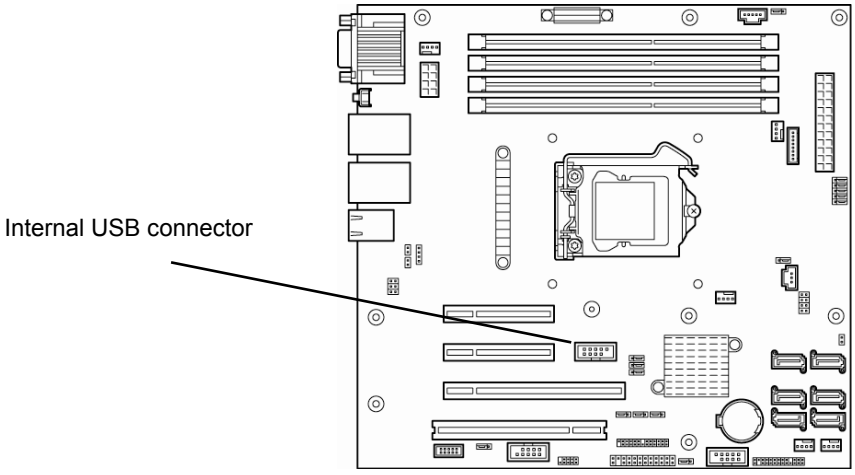
Important **If you pull the front bezel forward too much, you will break the lower hook. Gently slide it to prevent damaging the equipment.**

3. Slide the front bezel upward to release the hooks that engaged with the three holes at the lower part of the server and take it off the server.



1.6 Internal Flash Memory

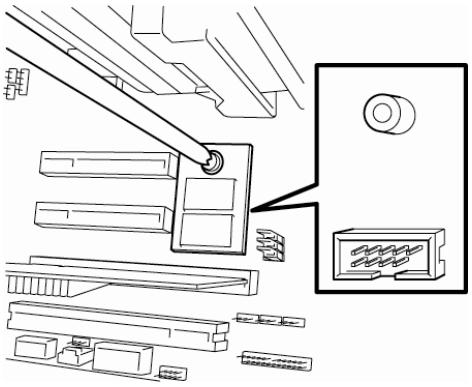
This section describes the procedure for installing the Internal Flash Memory.



1.6.1 Installation

Install the Internal Flash Memory in the following procedure.

1. Refer to steps 1 to 5 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Attach the Internal Flash Memory and fix it with the screw provided with this product.



1.6.2 Removal

To remove the Internal Flash Memory, reverse the installation procedure.

1.7 DIMM

Install a DIMM (Dual In-line Memory Module) to a DIMM slot on the motherboard in the server. The motherboard provides four slots to install DIMMs.

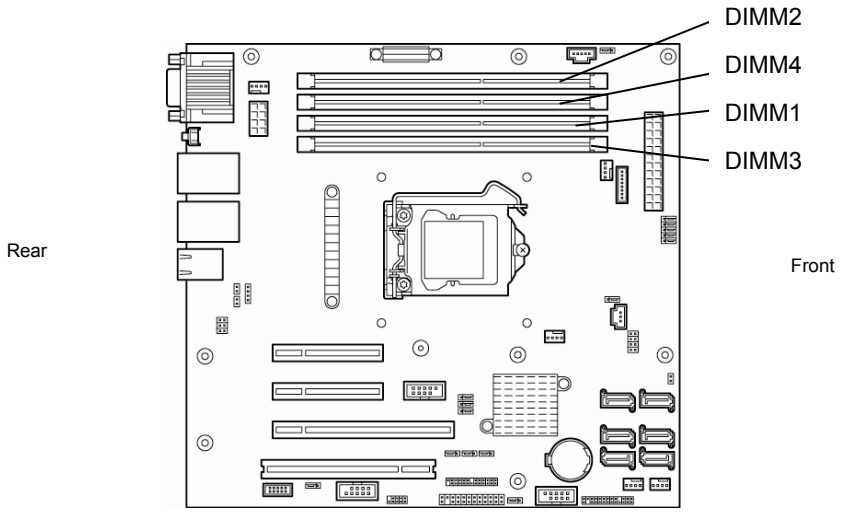
Up to 32 GB (8 GB × 4) of memory can be installed.

Important

- **Use only the DIMMs specified by NEC. Installing a DIMM from a third party may cause the server to fail. (You will be charged to repair failures or damages caused by the use of such products even within the warranty period.)**
- **Read through *Chapter 2 (1.2 Anti-static Measures)* beforehand.**

Tips

As about 750 MB of memory is used for PCI resources, the available memory size may be less than the mounted memory size.



Motherboard

This server supports Dual Channel memory mode.

If you run the server in Dual Channel mode, the data transfer speed of the memory doubles.

1.7.1 Maximum supported memory size

The maximum available memory size on the server depends on the architecture (x86 architecture) and OS specs.

A list of maximum memory sizes

OS	The maximum memory size supported on each OS	The maximum memory size supported on the server
Windows Server 2003 R2 Standard Edition Windows Server 2008 Standard x86 Edition	4 GB	4 GB (If using HW-DEP function) * Default factory settings
		About 3.3 GB (If not using HW-DEP function) Note: If you are not using the HW-DEP function, set the Execute Disable Bit (XD Bit) to Disable in the BIOS setup. It is enabled by default.
Windows Server 2008 R2 Foundation	8 GB	8 GB
Windows Server 2003 R2 Standard x64 Edition Windows Server 2008 Standard x64 Edition Windows Server 2008 R2 Standard	32 GB	32 GB
Windows Server 2008 Enterprise x86 Edition	64 GB	
Windows Server 2008 Enterprise x64 Edition Windows Server 2008 R2 Enterprise	2 TB	
RedHat Enterprise Linux 5 Server (x86)	16 GB	16 GB
RedHat Enterprise Linux 5 Server (EM64T)	256 GB	32 GB

1.7.2 Installation order

Install DIMMs one by one in order of increasing memory size into slots in the order of DIMM#1, DIMM#2, DIMM#3, and DIMM#4.

However, if you want to run the server in Dual Channel mode, observe the following when installing the DIMMs:

- Install them in pairs
- The two memories installed together must be of the same specifications and memory size.
- Install the pairs as DIMM#1 and DIMM#2, or DIMM#3 and DIMM#4 (the installation order between the pairs does not matter.)

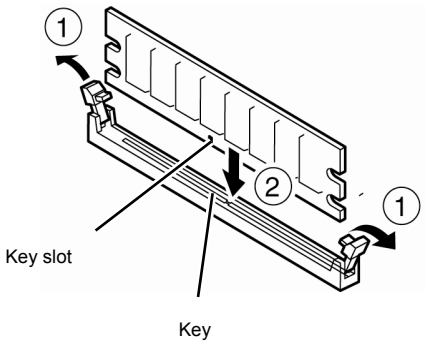
Installation examples

Example	Dual Channel Memory mode	DIMM#1	DIMM#2	DIMM#3	DIMM#4
1	Runs	2 GB DIMM (Standard)	2 GB DIMM	Not installed	Not installed
2	Runs	2 GB DIMM (Standard)	2 GB DIMM	2 GB DIMM	2 GB DIMM
3	Does not run	2 GB DIMM (Standard)	2 GB DIMM	2 GB DIMM	Not installed
4	Does not run	2 GB DIMM (Standard)	2 GB DIMM	Not installed	2GB DIMM

1.7.3 Installation

Install a DIMM by using the following procedure.

1. Refer to steps 1 to 5 in *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Hold the server with both hands and slowly and gently lay it so that the left side faces upward
3. Rotate both levers of the target DIMM slot outward.
4. Hold the DIMM vertically and push it all the way into the slot.
   When the DIMM is inserted into the slot, the lever automatically closes.



Important **Applying too much pressure on a DIMM or inserting a DIMM at an angle may break the DIMM or slot. Gently insert it straight into the slot.**

Note Make sure the DIMM is oriented correctly. The terminal side of a DIMM has the key and keyslot, preventing being wrongly inserted.

5. Firmly close the lever.
6. Continue to install or remove internal optional devices, mount and connect the server, and turn it on.
7. Confirm that no error messages are displayed in POST screen.
   If any error messages are displayed, refer to *Chapter 3 (1. POST Error Message)* in "*Maintenance Guide*".
8. Run the SETUP Utility, go to the **Advanced** menu, and check the display in **Memory Configuration**. Confirm that the added DIMM has been recognized in the BIOS (Confirm that the applicable **DIMM Group Status** is set to Normal.). (Refer to *Chapter 2 (1. Details of System BIOS)* in "*Maintenance Guide*".)
9. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, consult the manual provided with the operation system or contact the store where you purchased it or your maintenance service company.

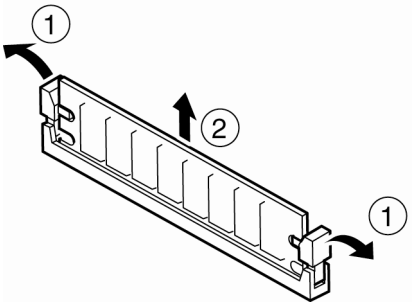
1.7.4 Removal

Remove a DIMM in the following procedure.

Note

- When removing a defective DIMM, check error messages displayed at POST or ESMPRO and check the DIMM slot where the defective DIMM is installed.
- At least one DIMM needs to be installed for the server to operate.

1. Refer to steps 1 to 5 in *Chapter 2 (1.3 Overview of Installation and Removal* for preparations.
2. Rotate both levers of the target DIMM slot outward.
   The DIMM is unlocked
3. Remove the DIMM by pulling it out from the slot in a straight direction.



Important **Applying too much pressure on a DIMM or pulling a DIMM at an angle may break the DIMM or slot. Gently pull it straight out of the slot.**

4. Assemble the server.
5. Turn on the server and confirm that no error messages are displayed on POST. If any error message is displayed, refer to *Chapter 3 (1. Post Error Message)* in "*Maintenance Guide*".
6. If you replaced a broken DIMM, select **Yes** in **Memory Configuration**-**Memory Retest** of the **Advanced** menu.
   After that, select **Save Changes and Exit** to reboot.
7. Set the paging file size to the recommended value (Total memory size x 1.5) or more.
   If using a Windows OS, refer to *Chapter 1 (7.1 Specifying Memory Dump Settings (Debug Information))* in "*Installation Guide (Windows)*".
   For other OS, consult the manual provided with the operation system or contact the store where you purchased it or your maintenance service company.

1.8 Use of Internal Hard Disk Drives in the RAID System

This section describes how to use the Hard Disk Drives installed in the HDD cage at the front of the server in the RAID System.

Important **If you use Hard Disk Drives in the RAID System or change the RAID level, initialize the Hard Disk Drives. If the Hard Disk Drive used in the RAID System contains valuable data, be sure to backup the Hard Disk Drive before installing the RAID Controller and configuring the RAID System.**

Note In the RAID System, use Hard Disk Drives that have the same specifications (capacity, rotational speed, and standard) for each Disk Array.

Tips

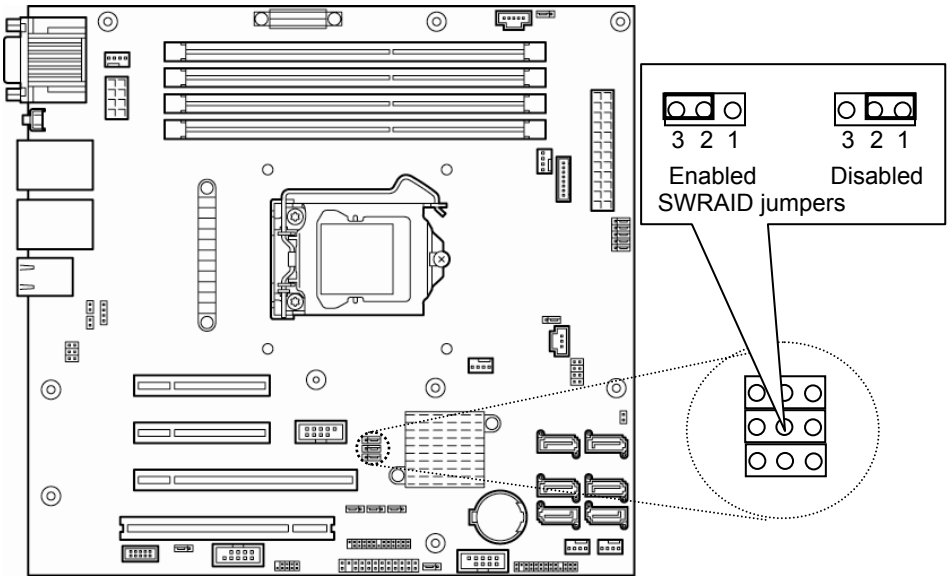
- Logical Drives can be created even with only one Physical Device.
- Understand the characteristics of each RAID Controller such as available RAID levels or Hard Disk Drives and choose an appropriate RAID Controller.
- Logical Drives except for RAID0 have a smaller usable capacity compared to the total capacity of the Hard Disk Drive in the Logical Drive, while disk reliability increases.

To configure the system, you can use either a software- controlled on-board RAID Controller (LSI Embedded MegaRAID™) or a hardware-controlled optional RAID Controller (N8103-128/129/130/134).

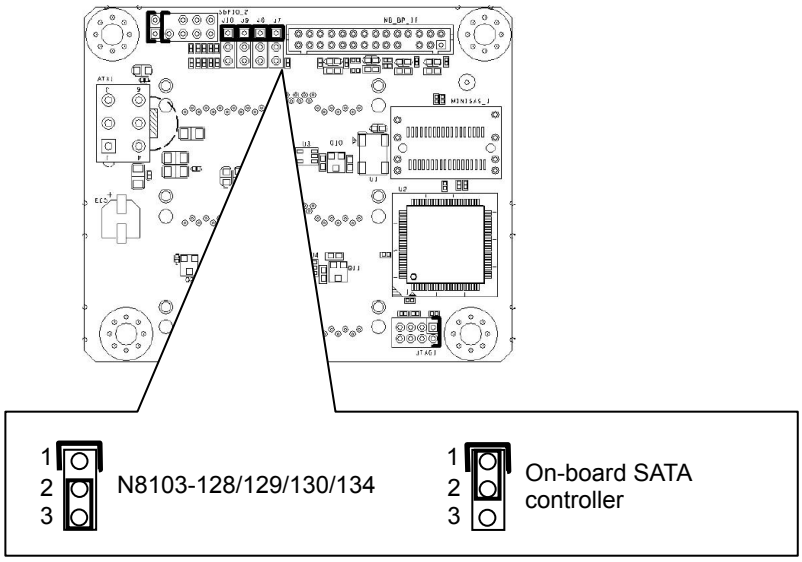
To use this RAID System, jumper settings on motherboard and backplane are required.

For the location of the jumpers and setting, refer to the following.

Jumper settings on the motherboard and backplane required to use the RAID Controller (LSI Embedded MegaRAID™) or optional RAID Controllers (N8103-128/129/130/134) are described in the images below.



Motherboard



Backplane for 2.5-inch Hard Disk Drives
(Installed on 2.5-inch model as standard)

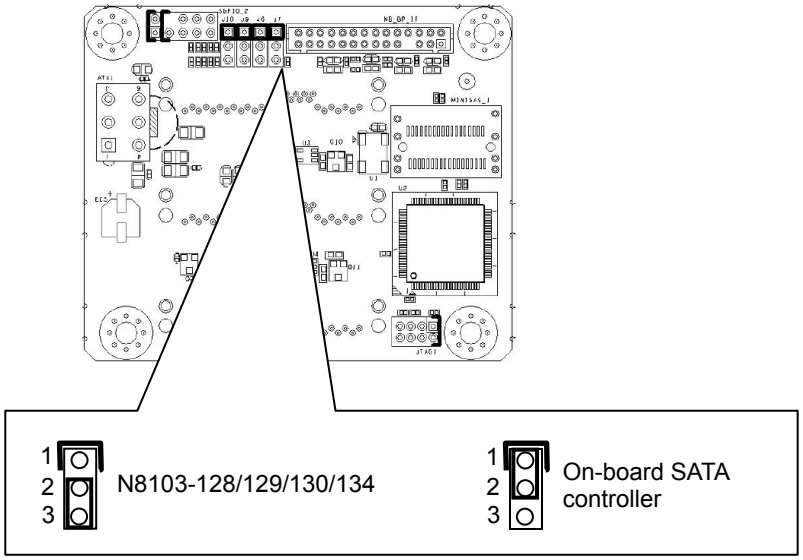
(a) When using on-board RAID Controllers (LSI Embedded MegaRAID™)

By changing the jumper setting for RAID configuration on the motherboard, the internal Hard Disk Drive can be recognized as a software-controlled RAID System Hard Disk Drive.

Jumper settings on the motherboard and backplane
Change the jumper pin settings as described below.

Jumper pins on motherboard (SWRAID)
Enabled: 2-3 / Disabled: 1-2 (Default value)

Backplane for 2.5-inch Hard Disk Drive (provided with 2.5-inch models) (J7)



After that, configure the RAID System using LSI Software RAID Configuration Utility.

For details, refer to *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*".

Tips If you use the EXPRESSBUILDER DVD supplied with the server for setup, the RAID System is automatically configured. Or, you intend to install Windows OS, OS also can be installed automatically and seamlessly.

(b) If an optional RAID Controller (N8103-128/129/130/134) is used

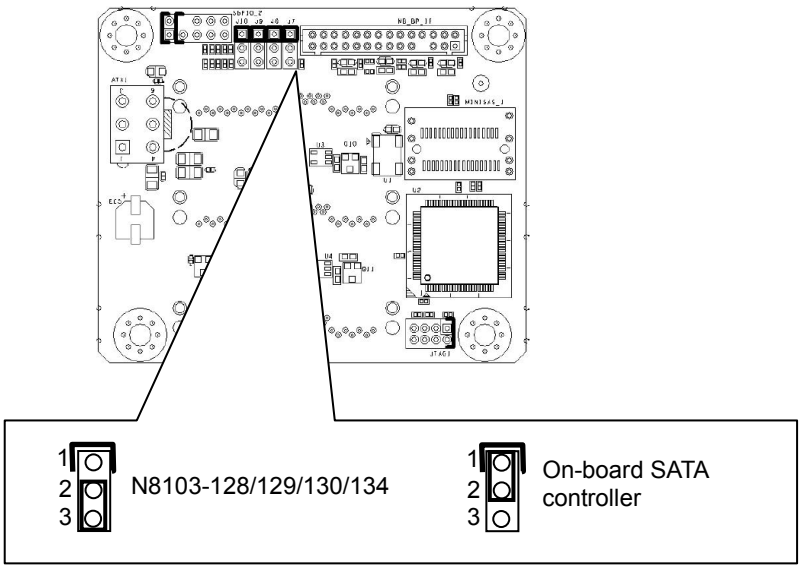
If using internal Hard Disk Drives in a RAID System with an optional RAID Controller (N8103-128/129/130/134) installed in the server, the following cable is required instead of using the interface cable supplied with the server.

- For 3.5-inch Hard Disk Drives: K410-253(00) internal SAS/SATA cable
- For 2.5-inch Hard Disk Drives: K410-180(00) internal SAS cable

Jumper settings on the motherboard and backplane
Change the jumper pin settings as described below.

Jumper pins on motherboard (SWRAID)
Disabled: 1-2 (Default value) / Enabled: 2-3

Backplane for 2.5-inch Hard Disk Drive (provided with 2.5-inch models) (J7)



Tips N8103-128/129 and N8103-128/129/130/134 are to be connected for 3.5-inch Hard Disk Drive model and for 2.5-inch Hard Disk Drive model respectively.

Note When installing an optional RAID Controller, start the BIOS Setup utility, select **PCI Configuration** from the **Advanced** menu, and then make sure that the parameter of **PCI Slot *xx* ROM** (*xx* is PCI slot number) is set to **Enabled**.

Important **Do not change the mode to hibernate when building a RAID System.**

(c) Installation

For the instruction of installing the optional RAID Controller (N8103-128/129/130/134), refer to *Chapter 2 (1.10 PCI Card)*.

Important **When connecting a RAID Controller, set the boot priority to 8th or higher in the Boot menu of the BIOS Setup utility. If the setting is 9th or lower, the configuration menu for RAID Controllers cannot be launched.**

(d) Removal

To remove the optional RAID Controller (N8103-128/129/130/134), reverse the installation procedure.

If you intend to use with the card removed, be sure to attach the slot cover attached to the riser card. The slot cover must be screwed into place.

1.8.1 Notes on setting up a RAID System

Note the following points when setting up a RAID System.

- The number of Hard Disk Drives required varies in each RAID level.
- If an on-board RAID Controller or optional RAID Controller (N8103-128/129) is used, the RAID System cannot be built in RAID5/RAID6.

RAID level	The minimum number of Hard Disk Drives required to set up a RAID System	
	On-board RAID Controller or N8103-128/129	N8103-130/134
RAID 0	1	1
RAID 1	2	2
RAID 5		3
RAID 6		3 (N8103-130), 4 (N8103-134)
RAID 10	4	4
RAID 50		6

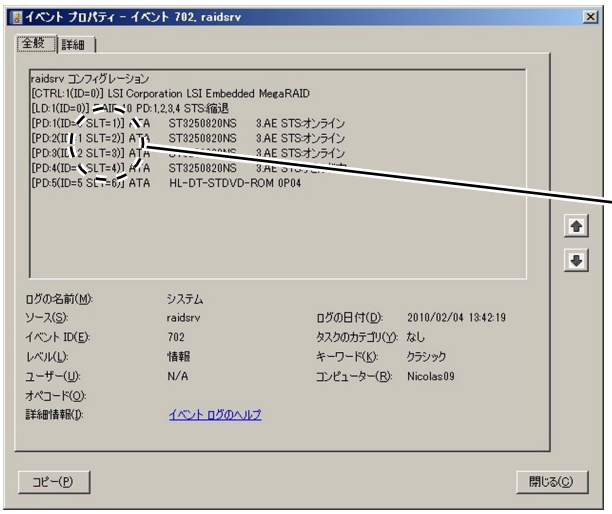
- Use SAS/SATA Hard Disk Drives or SSDs that have the same capacity and rotational speed.
- As the size of Logical Drive cannot be specified in RAID 10 with the on-board RAID Controller, the Logical Drive size will be at least 4 TB if a Hard Disk Drive of 2 TB or more is used. However, the Logical Drive where the OS is to be installed may be up to 2 TB due to OS restrictions, and therefore RAID 10 using a Hard Disk Drive of 2 TB or more cannot be supported if an on-board RAID Controller is used.

When installing an OS in your RAID System, you can easily complete the setup process, including RAID configuration and OS installation, by using EXPRESSBUILDER. If you are installing the OS manually, use the RAID System configuration utility. The utility can be run during POST which starts immediately after the server is turned on. For details on the procedure of configuring a Logical Drive, refer to *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*" or the manual supplied with the optional RAID Controller (N8103-128/129/130/134).

Important
- **Do not change the RAID System mode to hibernate.**
- **A mix of SAS and SATA drives cannot be used within the RAID System.**
- **Before configuring RAID System using EXPRESSBUILDER, be sure to clear the configuration information of the RAID Controller by referring to the manual of the relevant controller.**

- The display of slot numbers (SLT) for Hard Disk Drives in the OS system event log varies depending on the RAID Controller to be connected.
  The tables below show the insert position of Hard Disk Drives and slot numbers (SLT). The information on these tables is important when checking logs or replacing a Hard Disk Drive.

Example: Slot numbers (SLT) for HDD and SSD displayed in OS system event log



Models with 3.5-inch Hard Disk Drives installed

Insert position numbers displayed on the server	Slot numbers indicated	
	On-board RAID Controllers	Optional RAID Controllers (N8103-128/129/130/134)
0	SLT = 1	SLT = 1
1	SLT = 2	SLT = 2

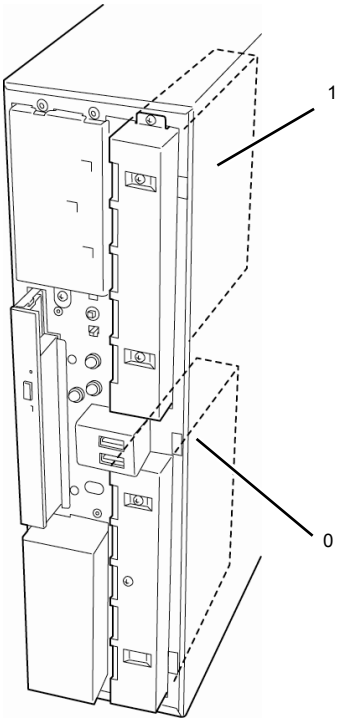
Models with 2.5-inch Hard Disk Drives installed

Insert position numbers displayed on the server	Slot numbers indicated	
	On-board RAID Controllers	Optional RAID Controllers (N8103-128/129/130/134)
0	SLT = 1	SLT = 1
1	SLT = 2	SLT = 2
2	SLT = 3	SLT = 3
4	SLT = 4	SLT = 4
5	SLT = 5	SLT = 5

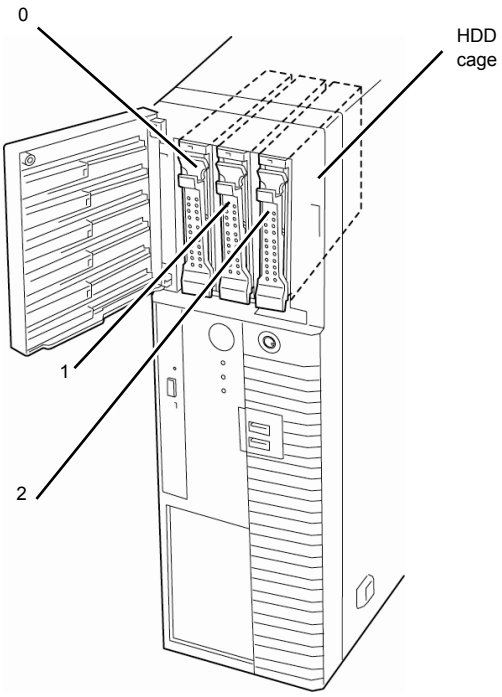
Tips The insert position number displayed on the server starts from 0.
SLT of on-board/optional RAID Controllers displayed starts from 1.

The insert position number displayed on the server

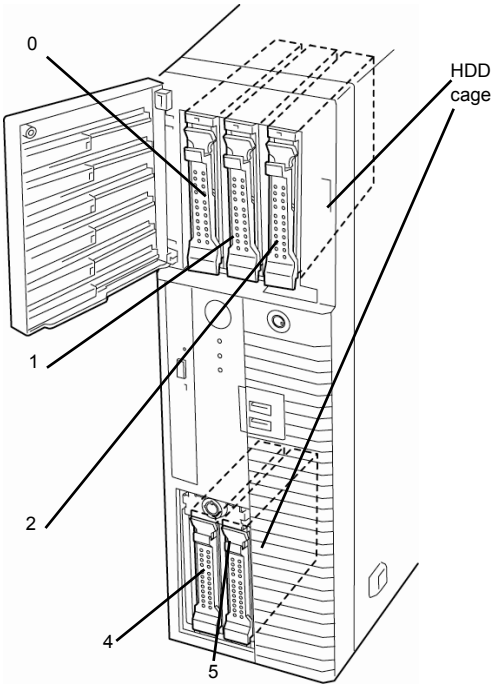
Models with 3.5-inch Hard Disk Drives installed



Models with 2.5-inch Hard Disk Drives installed (standard)



Models with 2.5-inch Hard Disk Drives installed
(when expansion 2.5-inch HDD cages are installed)



1.9 Extra Battery for RAID Controller

If a RAID Controller (N8103-128/129/130/134) is installed, use the optional extra battery to avoid data loss caused by accidents including temporary blackout during a write-back operation. The model of the extra battery to be used depends on RAID Controller.

- For N8103-129/130, use N8103-121 extra battery
- For N8103-128/134, use N8103-141 extra battery

1.9.1 Handling precautions

Below are the precautions to be observed whenever using the backup battery. Be sure to observe the following, otherwise property such as data or other devices might be destroyed.

- Use the extra battery that supports the RAID Controller used.
- The extra battery is a very delicate electronic device. Before installation, touch the metal frame part of the server to discharge the static electricity from your body.
- Do not drop or bump the backup battery.
- For recycling and disposing the backup battery, refer to the user's guide that comes with it.

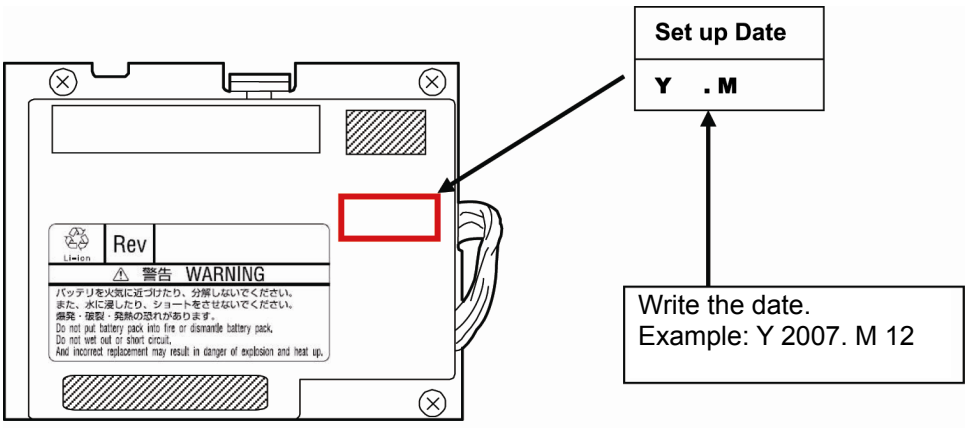
1.9.2 Installing N8103-121 extra battery

Install an extra battery in the server by using the following procedure.

Note Read through the user's guide supplied with the RAID Controller before installation.

Fill out the date on the label

Fill out the date on the label. Fill out the installation date on the setup date label supplied with the extra battery and attach it to the battery case.



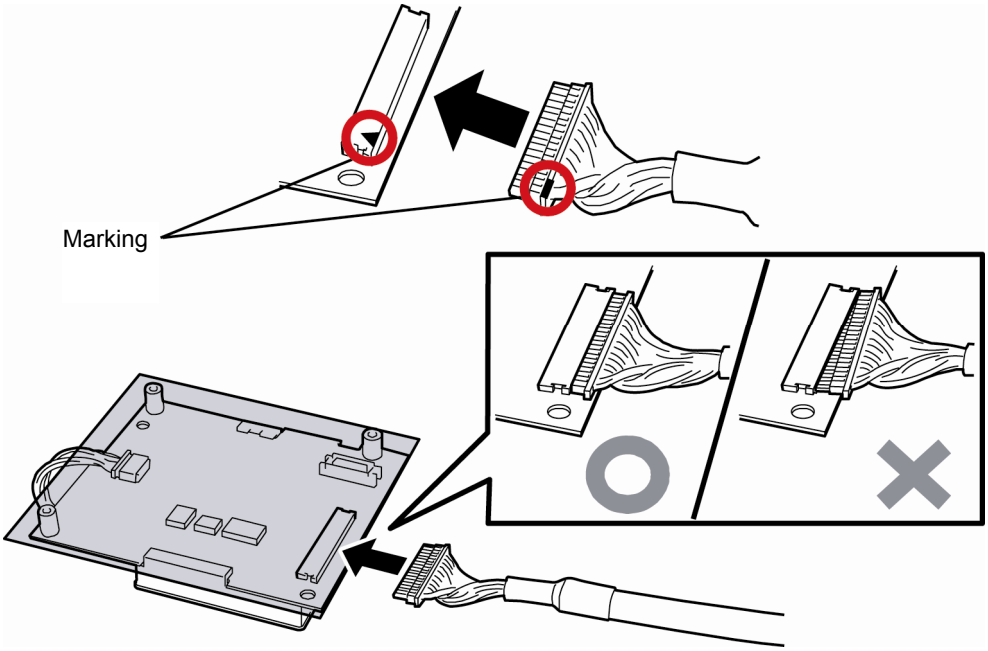
Important **The shelf life of the battery pack is about 2 years though actual life depends on the operating environment and conditions. If it has been used for 2 years or more, the maximum data backup time (72 hours) is not guaranteed. Replace it soon with a new battery pack, referring to the user's guide for the extra battery.**

Connecting the battery control cable

Referring to the image below, connect the battery control cable into the battery pack. Check the orientation of the connector and connect the cable straight into the connector.

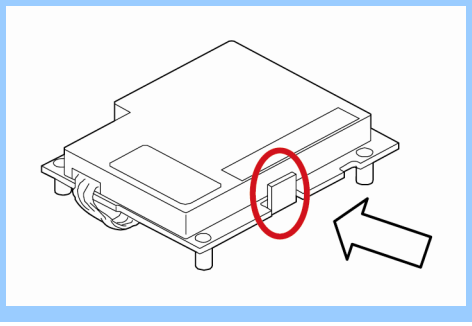
Orientation of the connector

Orient the markings of the connector and cable to fit each other, and then connect them.



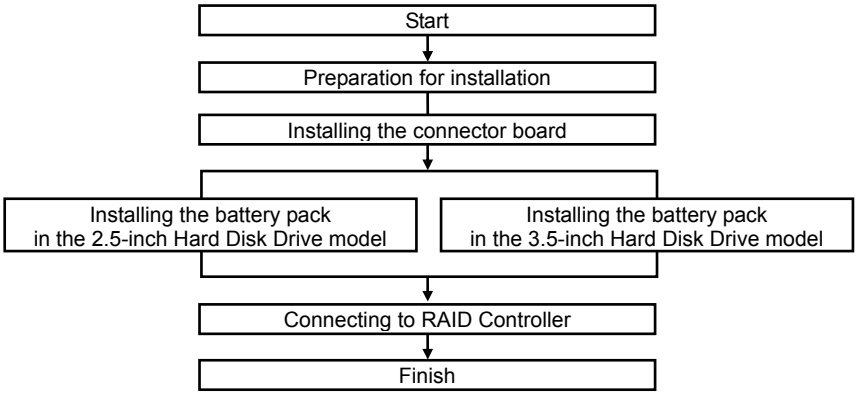
Important **When installing or removing the extra battery, pay special attention not to apply excessive pressure on the part of the battery cover marked in the image below.**

Otherwise, the part may break.



Installing the battery in the server

This section describes how to install this product in the server. Note that the installation position and procedure differ for 2.5-inch Hard Disk Drive models and 3.5-inch Hard Disk Drive models.


Start
Preparation for installation
Installing the connector board
Installing the battery pack in the 2.5-inch Hard Disk Drive model
Installing the battery pack in the 3.5-inch Hard Disk Drive model
Connecting to RAID Controller
Finish

Getting ready to install the battery

(1) Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.

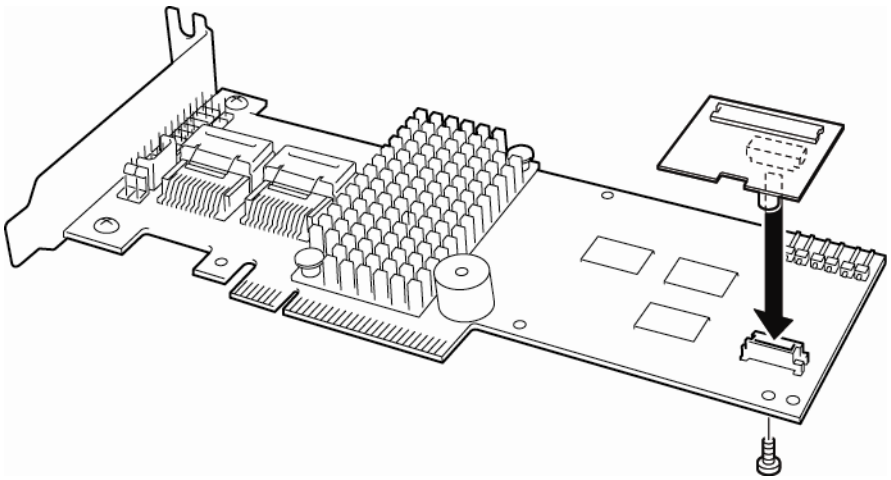
(2) While referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel*, remove the side cover and front bezel.

(3) If a RAID Controller is installed, remove the center bar to disconnect the internal SAS cable and remove the RAID Controller. For details, refer to *Chapter 2 (1.10 PCI Card)*.

Installing the connector board

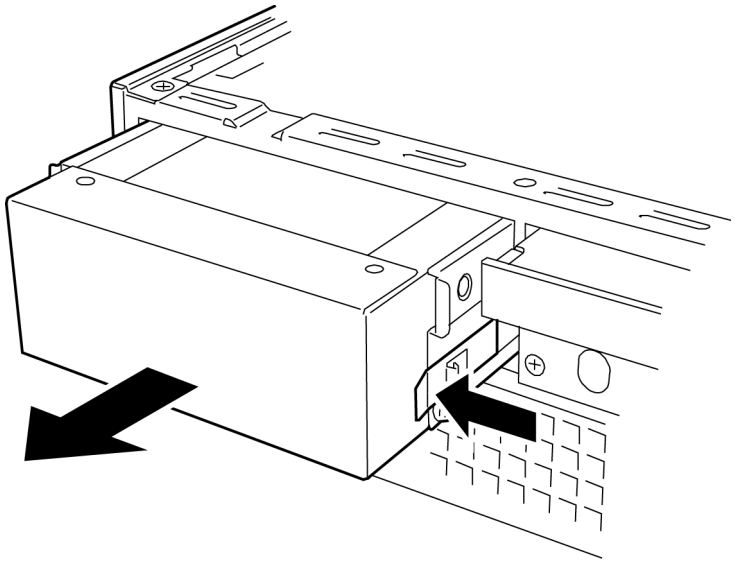
This section describes how to install the connector board to RAID Controller N8103-129/130.

(1) Securely connect the connector board to the connector of the RAID Controller and screw it with the attached screw (small) at the rear of the RAID Controller.

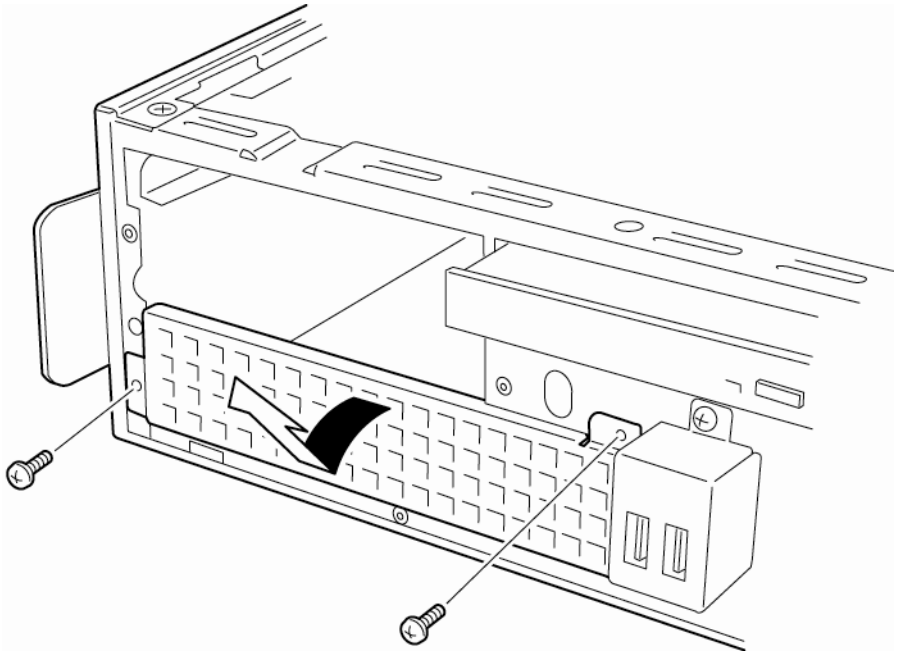


Installing a battery pack to 2.5-inch Hard Disk Drive models

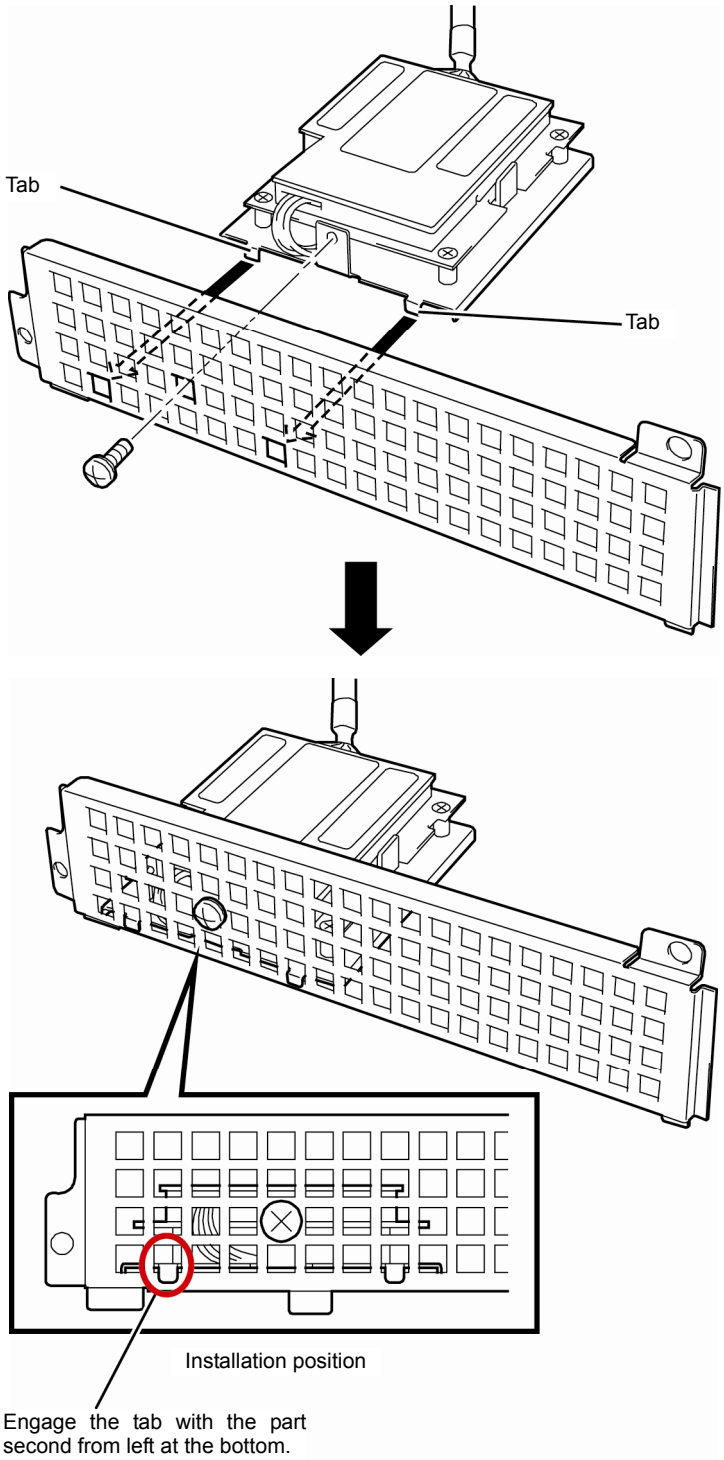
(1) Remove the file device or blank panel. For the blank panel, pull it toward you while pressing the tab on the right.



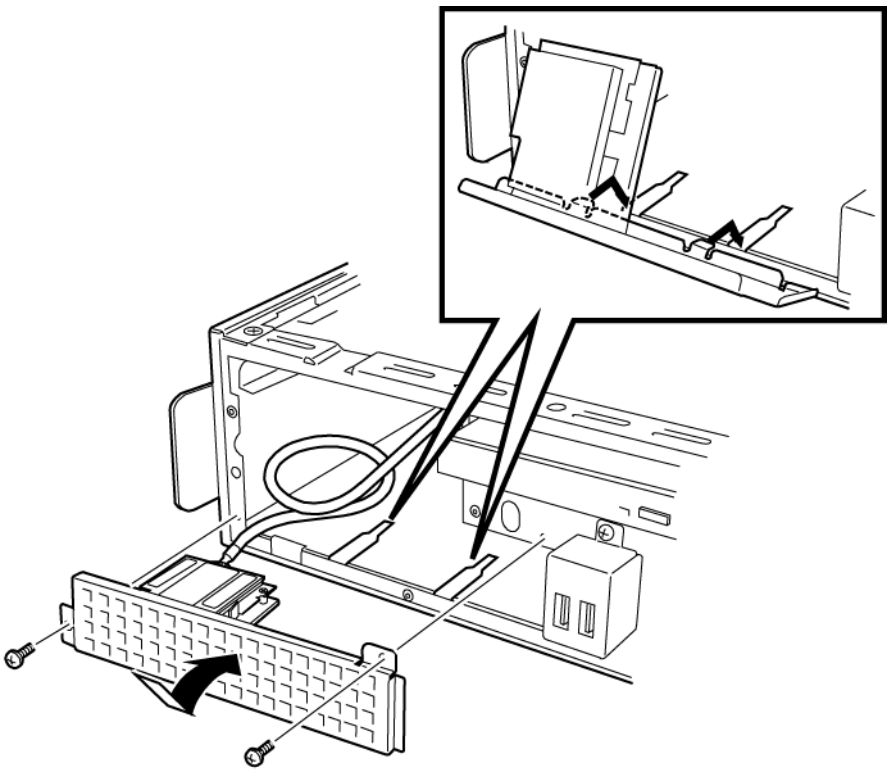
(2) Remove the two screws from the blank cover.



(3) Engage the tabs of the bracket with the grille of the blank cover and fix it with the attached screw (large). Refer to the image below for the installation position.

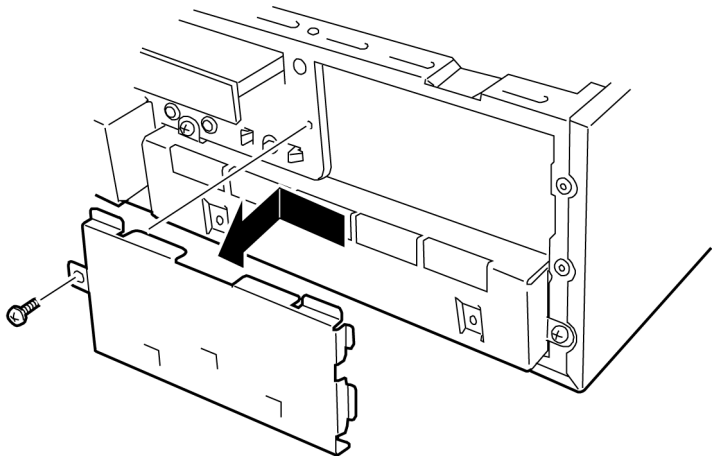


(4) Engage the tabs at the lower part of the blank cover with the chassis and fix it with the two screws. If the cable is too long, arrange it neatly, such as by coiling it once within the chassis.

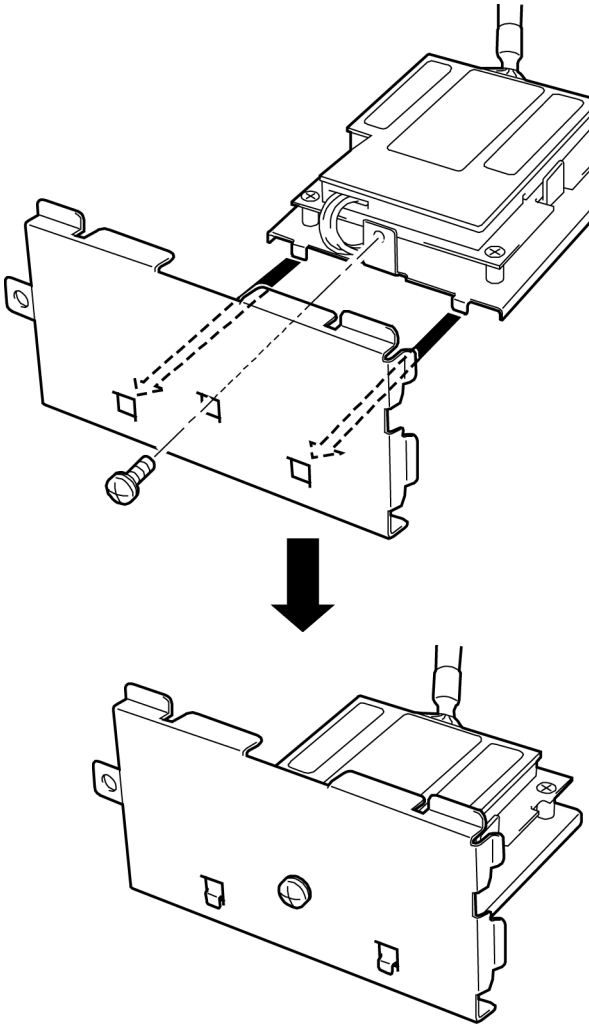


Installing a battery pack to 3.5-inch Hard Disk Drive models

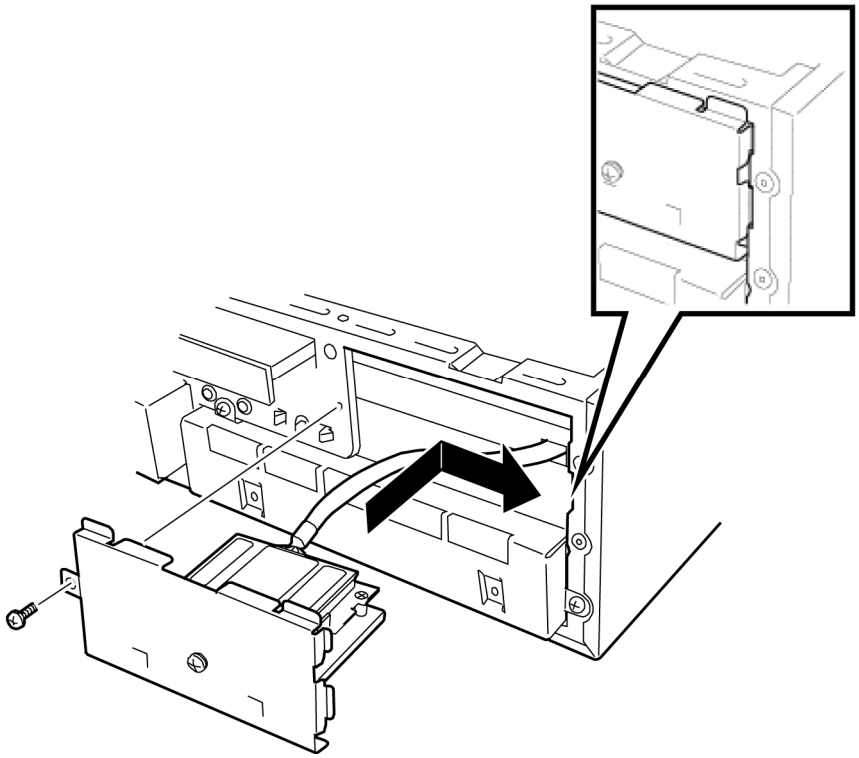
(1) Remove one screw from the blank cover and slide it to the side to release the blank cover.



(2) Engage the tabs of the bracket with the grille of the blank cover and fix it with the attached screw (large). Refer to the image below for the installation position.



(3) While pushing the blank cover to the right, fix it with one screw. If the cable is too long, arrange it neatly, such as by coiling once within the chassis.

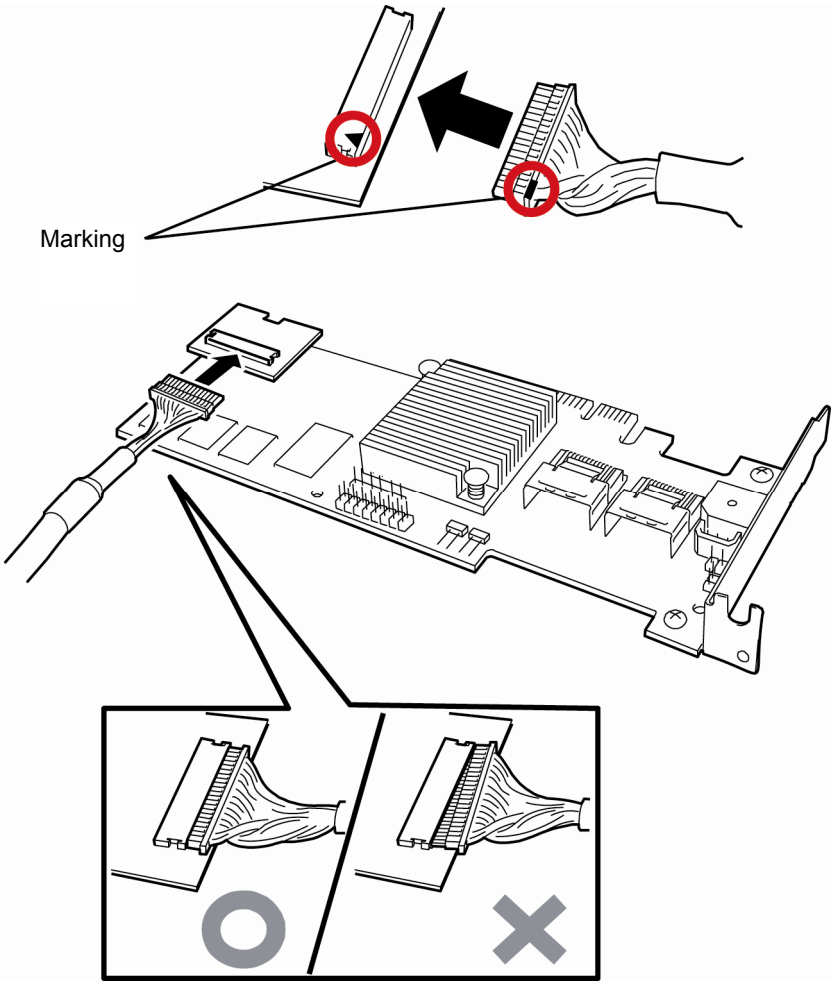


Connecting to a RAID Controller

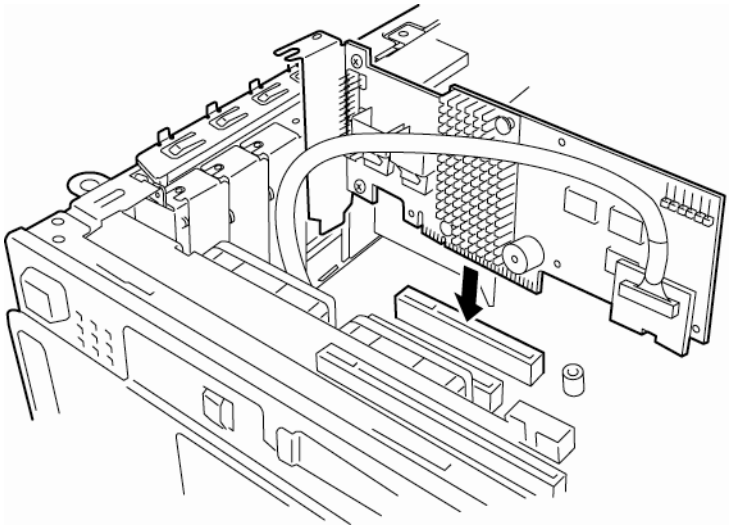
(1) Connect another connector of the battery control cable to the connector board on the RAID Controller. Check the orientation of the connector and connect the cable straight into the connector. Be careful not to press it in at an angle when connecting.

Orientation of the connector

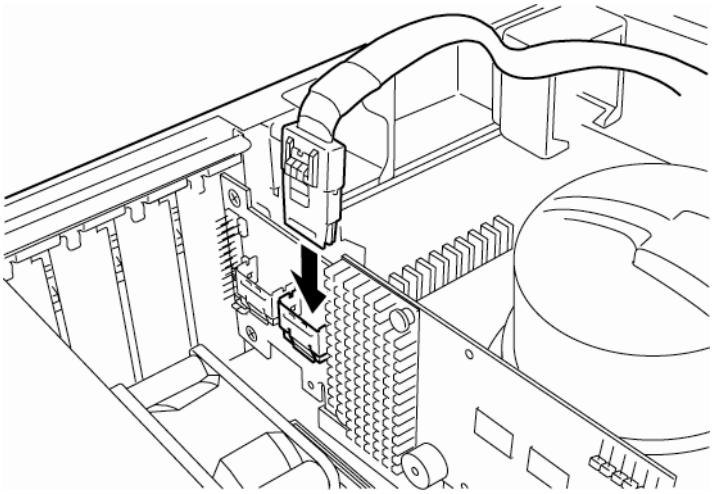
Orient and connect the cable so that the markings on the connector and cable fit each other.



(2) Install a RAID Controller into the PCI slot and fix it in place. Be careful not to disconnect any cables.



(3) Connect the internal SAS cable that you removed earlier.



(4) Put the removed parts back.

1.9.3 Installing N8103-141 extra battery

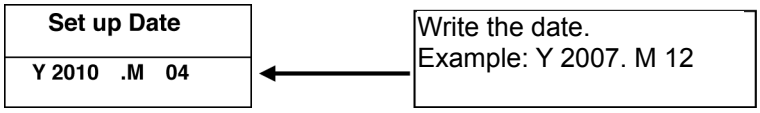
Install an extra battery in the server by using the following procedure.

Note Read through the user's guide supplied with the RAID Controller before installation.

Filling out the date on the Set up date label

Write down n the installation date (year and month) on the Set up date label supplied with the extra battery. Attach the label on the battery cover or somewhere easy to find on the server.

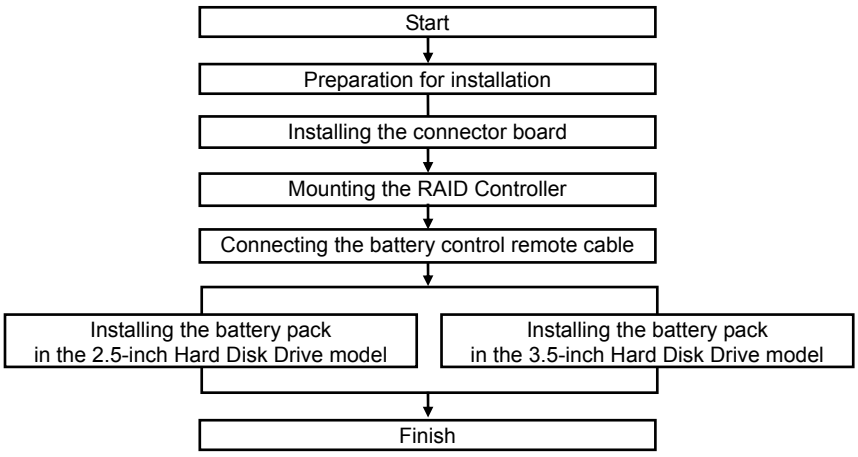
Fill out the *Set up date* label supplied with the battery



Important **The shelf life of the battery pack is about 2 years though actual life depends on the operating environment and conditions. If it has been used for 2 years or more, the maximum data backup time (72 hours) is not guaranteed. Replace it soon with a new battery pack, referring to the user's guide for the extra battery.**

Installing the battery in the server

This section describes how to install an extra battery in the server. Note that the installation position and procedure differ for 2.5-inch Hard Disk Drive models and 3.5-inch Hard Disk Drive models.


Start
Preparation for installation
Installing the connector board
Mounting the RAID Controller
Connecting the battery control remote cable
Installing the battery pack in the 2.5-inch Hard Disk Drive model
Installing the battery pack in the 3.5-inch Hard Disk Drive model
Finish

Getting ready to install the battery

(1) Refer to Chapter 2 (*1.3 Overview of Installation and Removal*) for preparations.

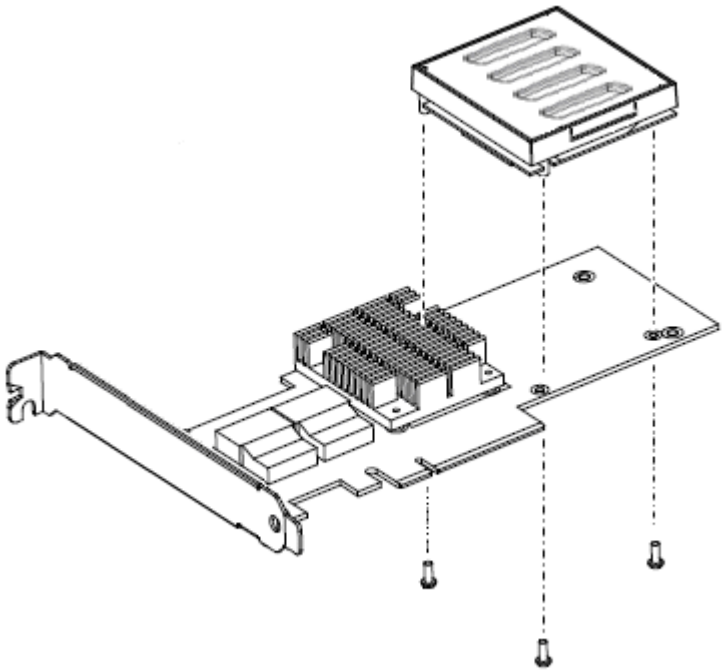
(2) While referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel*, remove the side cover and front bezel.

(3) If a RAID Controller is installed, remove the center bar to disconnect the internal SAS cable and remove the RAID Controller. For details, refer to *Chapter 2 (1.10 PCI Card)*.

Installing the connection board

Install the connection board to the RAID Controller.

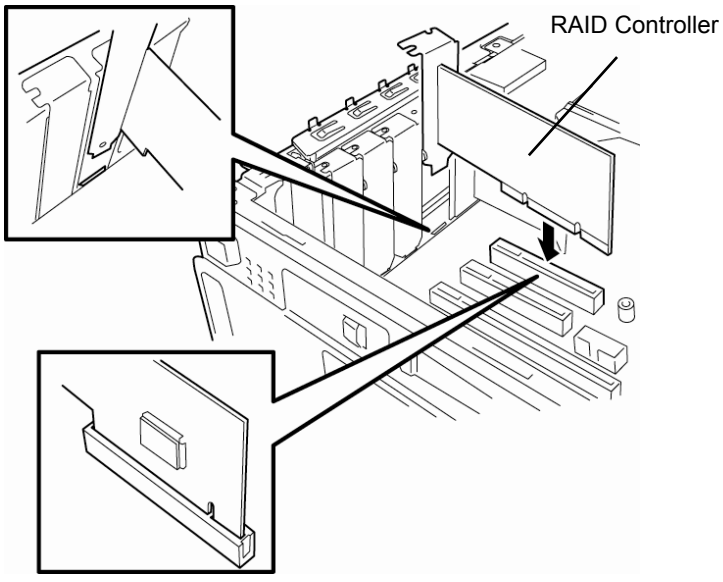
(1) Orient the remote battery connection board so that it will fit the connector on the RAID Controller and fix it with three screws from the rear side.



(2) After connecting the connection board, place and fix the RAID Controller in the PCI slot, paying attention not to disconnect the cable.

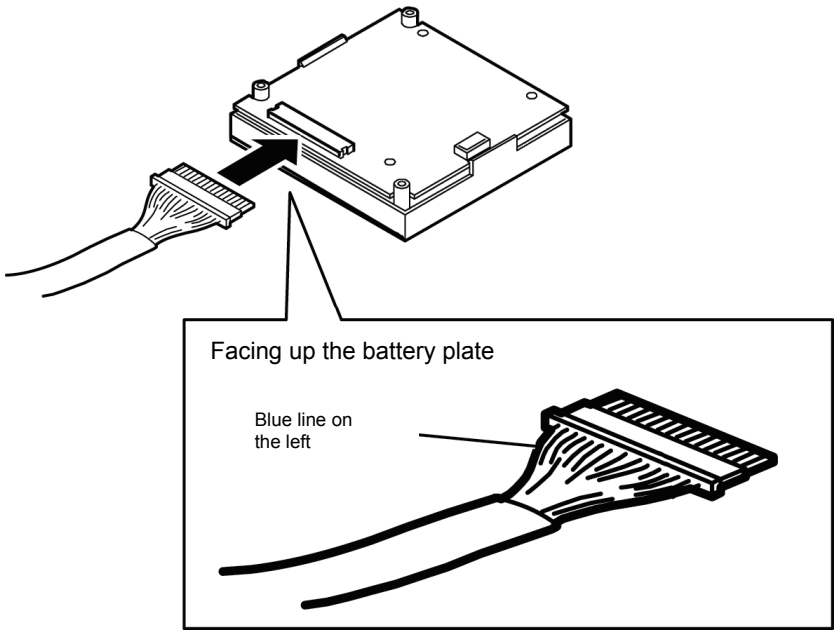
Installing a RAID Controller

Install the RAID Controller into the PCI slot of the server.



Connecting the battery control cable

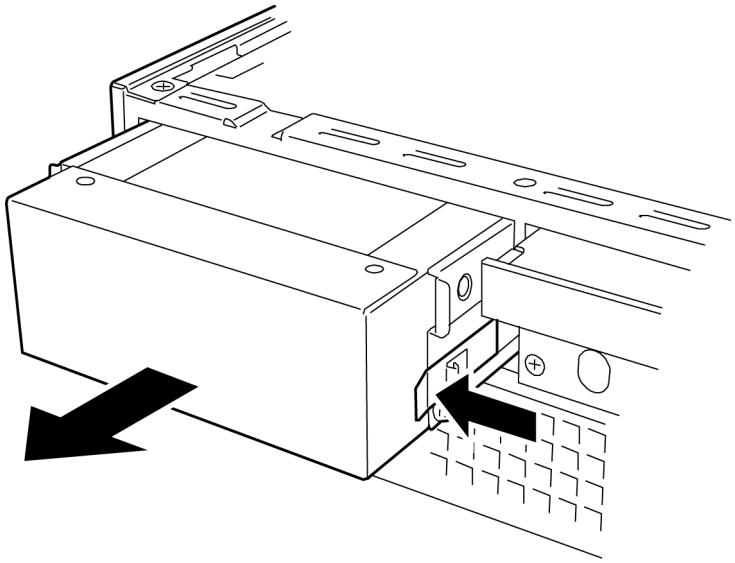
Referring to the image below, connect the battery control cable into the battery pack. Check the orientation of the connector and connect the cable straight into the connector.
Make sure the connector is oriented correctly by checking the following two points.



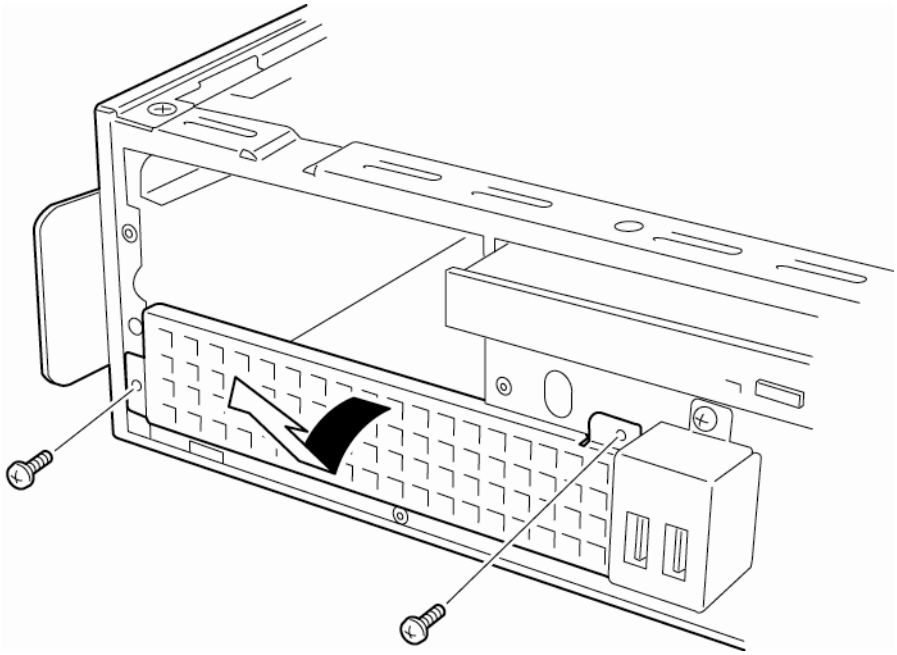
Important **When installing or removing an extra battery, pay special attention not to apply excessive pressure on the bracket tab. Otherwise, the part may break.**

Installing a battery pack to 2.5-inch Hard Disk Drive models

(1) Remove the file device or blank panel. For the blank panel, pull it toward you while pressing the tab on the right.

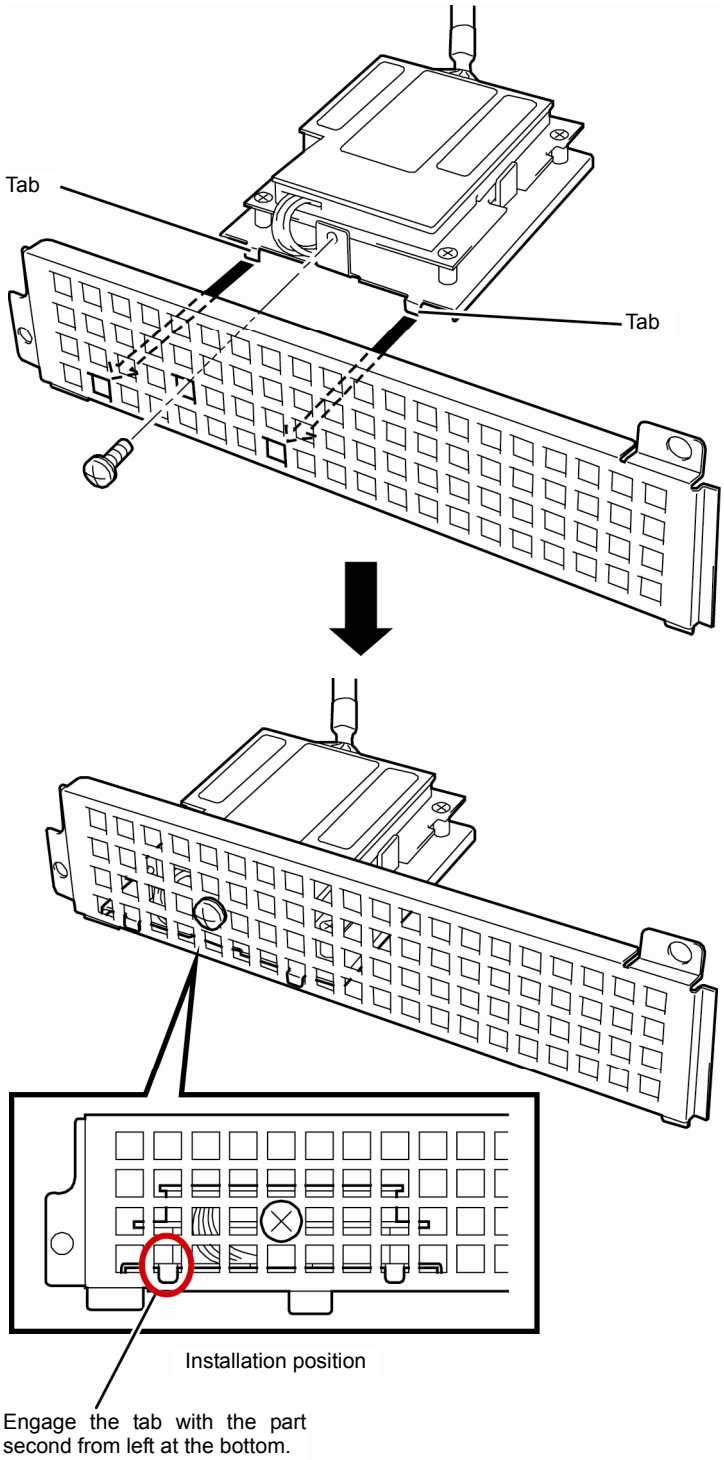


(2) Remove the two screws from the blank cover.

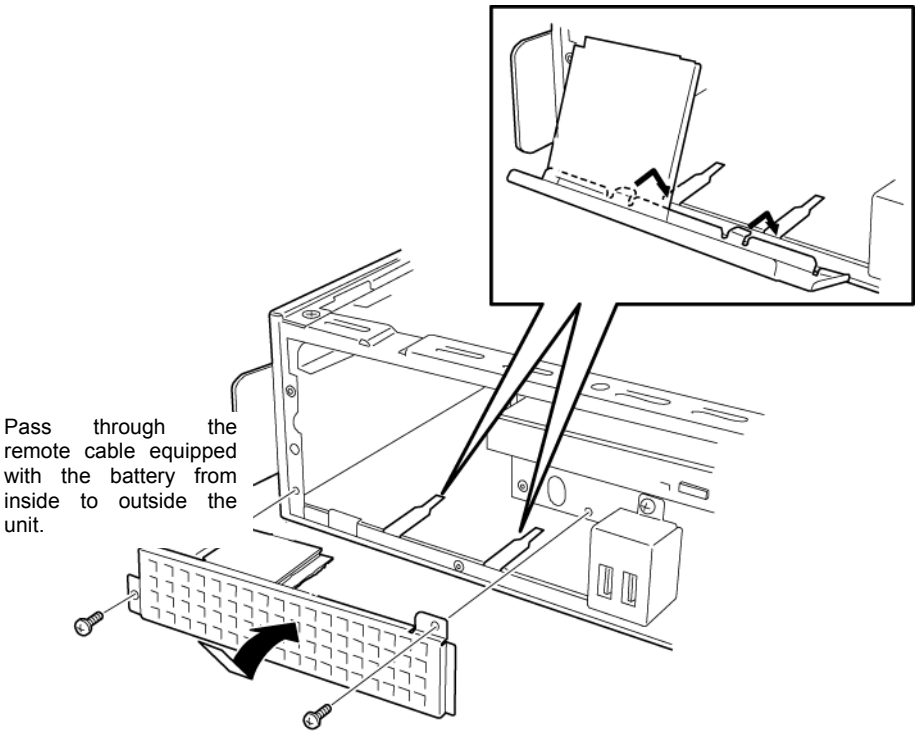


(3) Pass the bracket containing the battery and which is connected to the remote cable through the opening from which the blank cover was removed.

(4) Engage the tabs of the bracket with the grille of the blank cover and fix it with the attached screw (large). Refer to the image below for the installation position.



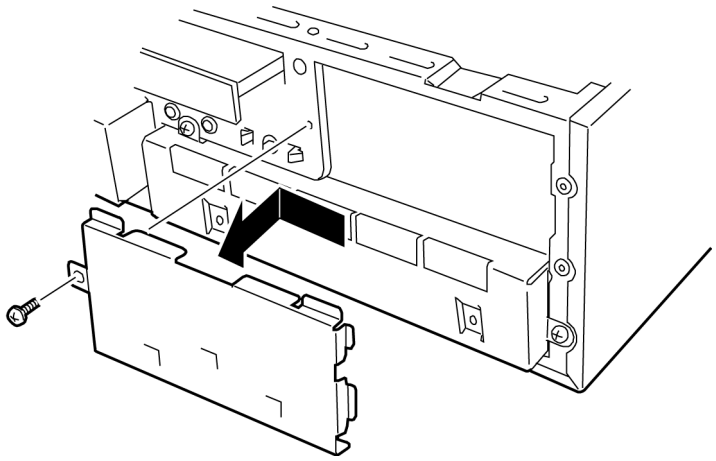
(5) Engage the tabs at the lower part of the blank cover with the chassis and fix it with the two screws. If the cable is too long, arrange it neatly, such as by coiling it once within the chassis.



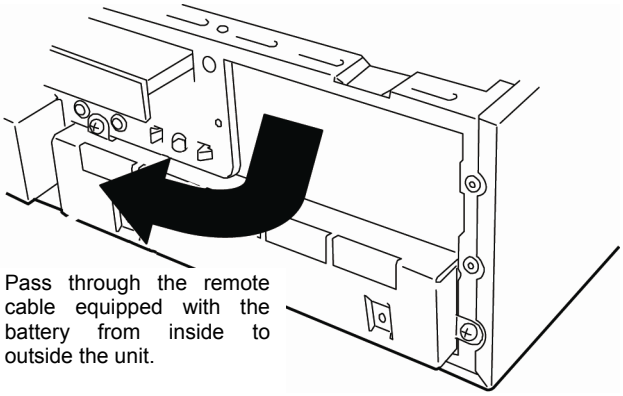
This concludes the installation of the battery module in a 2.5-inch Hard Disk Drive model.

Installing a battery pack to 3.5-inch Hard Disk Drive models

(1) Remove one screw from the blank cover and slide it to the side to release the blank cover.

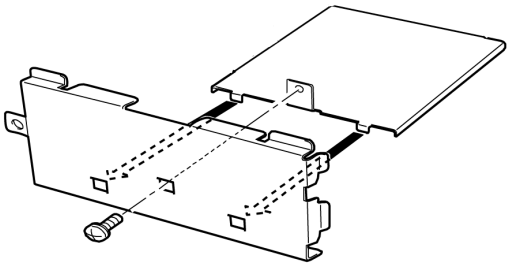


(2) Pass the bracket containing the battery and which is connected to the remote cable through the opening from which the blank cover was removed.

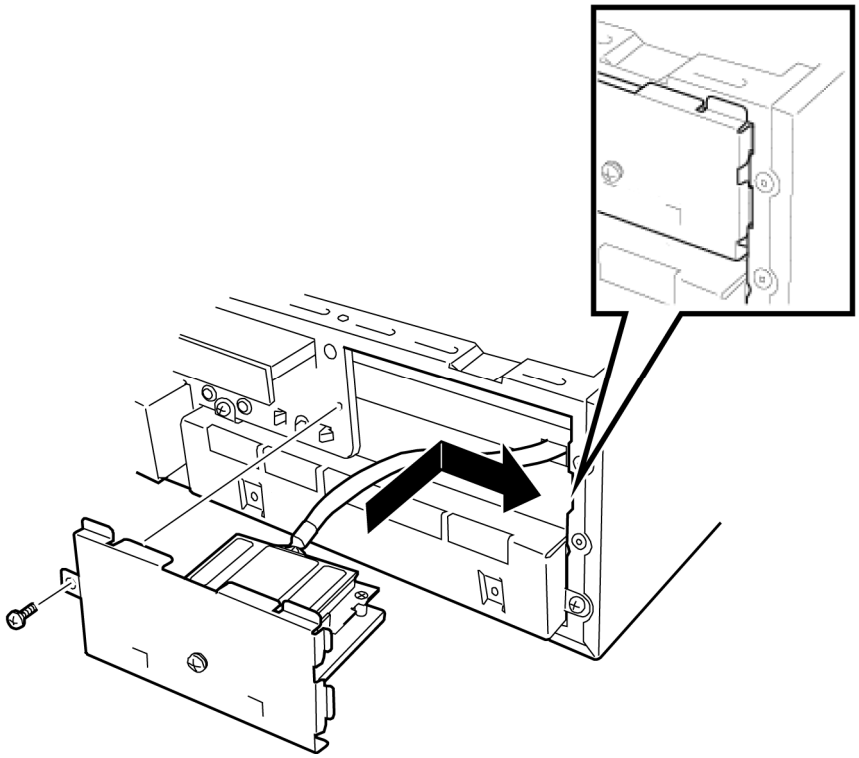


Pass through the remote cable equipped with the battery from inside to outside the unit.

(3) Engage the tabs of the bracket with the grille of the blank cover and fix it with the attached screw (large). Refer to the image below for the installation position.



(4) While pushing the blank cover to the right, fix it with one screw. If the cable is too long, arrange it neatly, such as by coiling once within the chassis.



This concludes the installation of the battery module in a 3.5-inch Hard Disk Drive model.

1.9.4 Removal

For removing the extra battery for the RAID Controller, reverse the installation procedure.

1.10 PCI Card

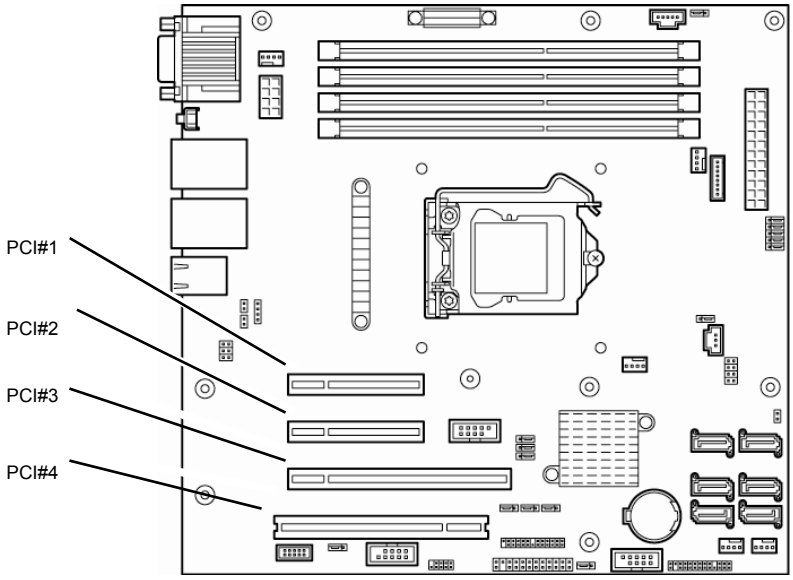
This server provides four slots where PCI cards can be installed.

Important

- **PCI cards are extremely sensitive to static electricity. Be sure to wear a wrist strap (arm band or anti-static gloves) to discharge static electricity from your body before handling the PCI card. Do not touch the PCI card terminals or parts with bare hands or place the PCI card on a place where anti-static measures have not been taken. For an explanation of electrostatics, refer to *Chapter 2 (1.2 Anti-static Measures)*.**
- **When installing PCI cards, refer to *Chapter 2 (1.10.2 List of option devices and installation slots)* to prevent mistaking slot numbers.**
- **Configure the Option ROM in [PCI Configuration] according to the application of the installed PCI card. For the configuration instructions, refer to *Chapter 2 (1. Details of system BIOS)* in "*Maintenance Guide*". Disabling the deployment of Option ROM can not only prevent memory consumption but also shorten the startup time.**

Tips

PCI#3 and PCI#4 are not supported by water-cooled models.



Motherboard

1.10.1 Notes

Read the following notes when installing or removing a PCI card.

- Do not touch the terminals of cards and the leads of electronic components with your bare hand. Fingerprints and dust left on them cause the server to malfunction due to a connection failure or damage to the leads.
- The search order for PCI bus slot on boot is as follows.
  Slot3 → Slot1→ Slot2 → Slot4
- The PCI devices of the same type (including onboard PCI device) may be recognized in different order from that described above, depending on OS or RAID System BIOS utility. Check the slot location of PCI device by PCI bus number, device number and function number shown in the table below.

PCI device	Bus number	Device number	Function number
Onboard NIC1	4h	0	0
Onboard NIC2	4h	0	1
Slot 1	2h	0	×
Slot 2	3h	0	×
Slot 3	1h	0	×
Slot 4	6h	0	0

- Set "**Disabled**" for the optional ROM of a LAN device not to be booted by using the BIOS Setup utility.
- If an additional bootable PCI card (such as a RAID Controller, SCSI controller, or LAN card) is installed, the boot priority may change. After the installation, set the boot priority in the **Boot** menu of the BIOS Setup utility.
- If a bootable device such as a PCI card or USB device is added, the boot order may change.
  In the BIOS Setup utility, select **Hard Drive BBS Priorities** from the **Boot** menu, and then specify a higher priority for the boot device.
  Boot → **Hard Drive BBS Priorities** → Check the display
  If the boot device is an HDD under an optional RAID Controller, the display is `(Bus xx Dev 00) PCI RAID Adapter`.
  Note that the value for *xx* changes depending on the PCI slot where a RAID board is installed.

1.10.2 List of option devices and installation slots

3.5-inch Hard Disk Drive model/air-cooling system

Model name	Product name		PCI EXPRESS 2.0			PCI	Remarks
			PCI#1	PCI#2	PCI#3	PCI#4	
		PCI slot performance*1	X4lane	X4lane	X16lane	32-bit/ 33 MHz	
		Slot size	Low Profile				
		PCI card type*1	X8 socket	x8 socket	X16 socket	5 V	
		Available card size	Up to167.6 mm (MD2)				
N8103-107	SCSI controller (Card performance: PCI EXPRESS (x1))		–	○	○	–	Maximum: 2 Connects to internal and external devices Cannot mix with N8103-75
N8103-128	RAID Controller (128 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	–	–	–	Connects with internal drives Can mount internal battery N8103-141 (450 mm cable)
N8103-134	RAID Controller (512 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	–	–	–	
N8103-129	RAID Controller (256 MB, RAID 0/1) (Card performance: PCI EXPRESS 2.0 (x8))		○	–	–	–	Connects with internal drives Can mount internal battery N8103-121
N8103-130	RAID Controller (256 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	–	–	–	
N8104-134	1000BASE-T connection board(2 ch) (Card performance: PCI EXPRESS (x4))		○	○	○	–	For adding LAN Teaming (AFT/SFT/ALB) and bonding with N8104-134 and on-board LAN is supported. Up to 2 teams per system. Up to 2 ports per team.
N8117-01A	Additional RS-232C connector kit *2		○	○	○	○	For additional serial (RS-232C) port

○ Can be installed – Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).
<e.g.> 1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)
Socket: Indicates the connector size. A card up to the number of sockets can be connected.
<e.g.> x4socket = x1card, x4card can be installed. x8 card cannot be installed.

*2 The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).

- The depth of mountable boards is up to 167.6 mm (MD2).
- For details of functions of each card, refer to the technical guide.
- The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
- Even if you use PCI cards of a higher performance than the PCI slot, the operation of the device will be that of the PCI slot.

About the standard network

You can use functional equivalents of AFT/SFT/ALB teaming with the standard network and the following LAN cards:
N8104-134

3.5-inch Hard Disk Drive model/water-cooling system

Model name	Product name		PCI EXPRESS 2.0		Remarks
			PCI#1	PCI#2	
		PCI slot performance*1	X4lane	X4lane	
		Slot size	Low Profile		
		PCI card type*1	X8 socket	x8 socket	
		Available card size	Up to167.6 mm (MD2)		
N8103-107	SCSI controller (Card performance: PCI EXPRESS (x1))		−	○	Connects to internal and external devices
N8103-128	RAID Controller (128 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	−	Connects with internal drives Can mount internal battery N8103-141 (450 mm cable)
N8103-134	RAID Controller (512 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	−	
N8103-129	RAID Controller (256 MB, RAID 0/1) (Card performance: PCI EXPRESS 2.0 (x8))		○	−	Connects with internal drives made by LSI Technology Internal battery [N8103-121 or the successor] can be installed.
N8103-130	RAID Controller (256 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	−	
N8104-134	1000BASE-T connection board(2 ch) (Card performance: PCI EXPRESS (x4))		○	○	For adding LAN Teaming (AFT/SFT/ALB) and bonding with N8104-134 and on-board LAN is supported. Up to 2 teams per system. Up to 2 ports per team.

○ Can be installed − Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).
<e.g.> 1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)
Socket: Indicates the connector size. A card up to the number of sockets can be connected.
<e.g.> x4socket = x1card, x4card can be installed. x8 card cannot be installed.

*2 The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).

- The depth of mountable boards is up to 167.6 mm (MD2).
- For details of functions of each card, refer to the technical guide.
- The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
- Even if you use PCI cards of a higher performance than the PCI slot, the operation of the device will be that of the PCI slot.

About the standard network

You can use functional equivalents of AFT/SFT/ALB teaming with the standard network and the following LAN cards:
N8104-134

2.5-inch Hard Disk Drive model/air-cooling system

Model name	Product name		PCI EXPRESS 2.0			PCI	Remarks
			PCI#1	PCI#2	PCI#3	PCI#4	
		PCI slot performance*1	X4lane	X4lane	X16lane	32-bit/ 33 MHz	
		Slot size	Low Profile				
		PCI card type*1	X8 socket	x8 socket	X16 socket	5 V	
		Available card size	Up to 167.6 mm (MD)				
N8103-107	SCSI controller (Card performance: PCI EXPRESS (x1))		–	○	○	–	Connects to internal and external devices Cannot mix with N8103-75
N8103-128	RAID Controller (128 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	–	–	–	Connects with internal drives Can mount internal battery N8103-141 (450 mm cable)
N8103-134	RAID Controller (512 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	–	–	–	
N8103-129	RAID Controller (256 MB, RAID 0/1) (Card performance: PCI EXPRESS 2.0 (x8))		○	–	–	–	Connects with internal drives made by LSI Technology Can mount internal battery N8103-121
N8103-130	RAID Controller (256 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	–	–	–	
N8104-134	1000BASE-T connection board(2 ch) (Card performance: PCI EXPRESS (x4))		○	○	○	–	For adding LAN Teaming (AFT/SFT/ALB) and bonding with N8104-134 and on-board LAN is supported. Up to 2 teams per system. Up to 2 ports per team.
N8117-01A	Additional RS-232C connector kit *2		○	○	○	○	For additional serial (RS-232C) port

○ Can be installed – Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).
<e.g.> 1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)
Socket: Indicates the connector size. A card up to the number of sockets can be connected.
<e.g.> x4socket = x1card, x4card can be installed. x8 card cannot be installed.

*2 The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).

- The depth of mountable boards is up to 167.6 mm (MD2).
- For details of functions of each card, refer to the technical guide.
- The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
- Even if you use PCI cards of a higher performance than the PCI slot, the operation of the device will be that of the PCI slot.

About the standard network

You can use functional equivalents of AFT/SFT/ALB teaming with the standard network and the following LAN cards:
N8104-134

2.5-inch Hard Disk Drive model/water-cooling system

Model name	Product name		PCI EXPRESS 2.0		Remarks
			PCI#1	PCI#2	
		PCI slot performance*1	X4lane	X4lane	
		Slot size	Low Profile		
		PCI card type*1	X8 socket	x8 socket	
		Available card size	Up to167.6 mm (MD2)		
N8103-107	SCSI controller (Card performance: PCI EXPRESS (x1))		−	○	Connects to internal and external devices
N8103-128	RAID Controller (128 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	−	Connects with internal drives Can mount internal battery N8103-141 (450 mm cable)
N8103-134	RAID Controller (512 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	−	
N8103-129	RAID Controller (256 MB, RAID 0/1) (Card performance: PCI EXPRESS 2.0 (x8))		○	−	Connects with internal drives Can mount internal battery N8103-121
N8103-130	RAID Controller (256 MB, RAID 0/1/5/6) (Card performance: PCI EXPRESS 2.0 (x8))		○	−	
N8104-134	1000BASE-T connection board(2 ch) (Card performance: PCI EXPRESS (x4))		○	○	For adding LAN Teaming (AFT/SFT/ALB) and bonding with N8104-134 and on-board LAN is supported. Up to 2 teams per system. Up to 2 ports per team.

○ Can be installed − Cannot be installed

*1 Lane: Indicates the transfer performance (transfer bandwidth).
<e.g.> 1 lane = 2.5 Gbps (unidirectional), 4 lanes = 10 Gbps (unidirectional)
Socket: Indicates the connector size. A card up to the number of sockets can be connected.
<e.g.> x4socket = x1card, x4card can be installed. x8 card cannot be installed.

*2 The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).

- The depth of mountable boards is up to 167.6 mm (MD2).
- For details of functions of each card, refer to the technical guide.
- The card performance described in the parentheses after the Product name indicates the maximum operation performance of the card.
- Even if you use PCI cards of a higher performance than the PCI slot, the operation of the device will be that of the PCI slot.

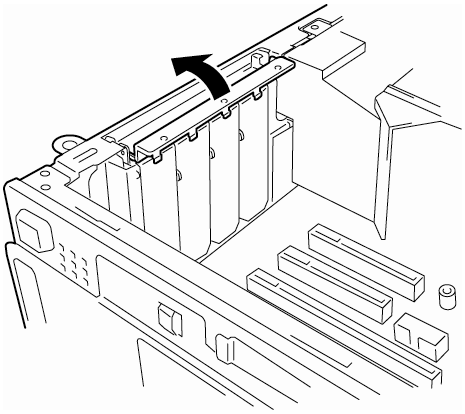
About the standard network

You can use functional equivalents of AFT/SFT/ALB teaming with the standard network and the following LAN cards:
N8104-134

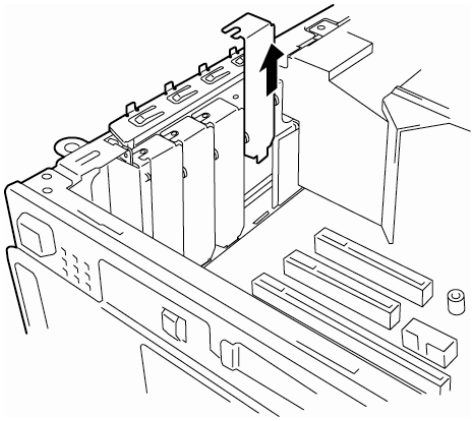
1.10.3 Installation

Install a PCI card to connect to a PCI slot by using the following procedure.

1. Before installation, make sure the switch or jumper settings on the card are properly set according to the instruction manual supplied with the card if necessary.
2. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
3. Remove the side cover while referring to *Chapter 2 (1.4* Removing the Side Cover*)*.
4. Open the PCI slot retention.

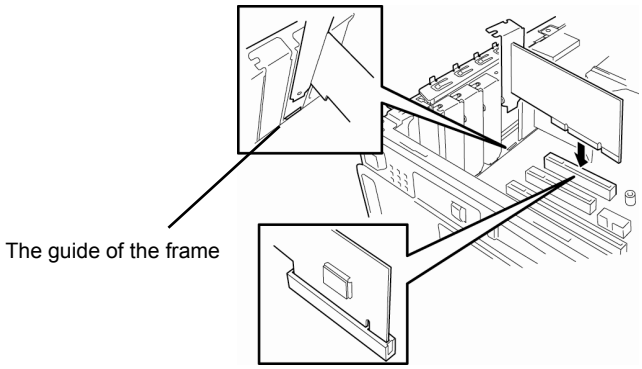


5. Remove the expansion slot cover aligned with the slot where you are going to install a card.



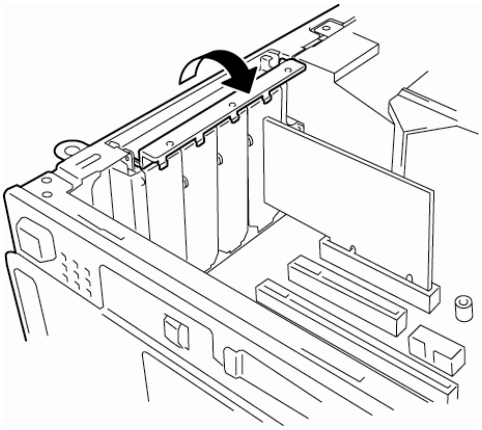
Important **Keep the removed slot cover for future use.**

6. Orient the component side of the card toward the bottom of the server. When the rear panel of the card is firmly engaged with the spring, firmly press the card into the slot so that the component parts of the card securely connect to the slot.



Important **If you have trouble installing the card, remove the card once and try again. If you apply excessive pressure on the card, there is a risk of breaking the card.**

7. Close the PCI slot retention.
When it locks, you hear a clicking sound.



8. Assemble the server.
9. Turn on the server and confirm that no error messages are displayed in POST.
If an error message is displayed, take notes on the message and ask your maintenance service company for maintenance.

1.10.4 Configuration after installing

Depending on the type of card installed, you might need to use a utility (the BIOS setup utility included with this server or a setup utility provided with the card) following installation to modify server settings.

Follow the instructions in the manual provided with the card to specify the correct settings.

After turning the server power on, the PCI bus numbers are scanned in ascending order. If the option ROM installed in the card contains a BIOS utility, the startup message (banner) is displayed in ascending order of the PCI bus numbers.

1.10.5 Removal

Remove a PCI card connected to a PCI slot by using the following procedure.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover while referring to *Chapter 2 (1.4 Removing the Side Cover)*.
3. Refer to installation step 4 to open the PCI slot retention.
4. Remove the card.
5. Attach the expansion slot cover, and refer to installation step 7 to close the PCI slot retention.
6. Assemble the server.
7. Turn on the server and confirm that no error messages are displayed in POST.
   If an error message is displayed, take notes on the message and ask your maintenance service company for maintenance.

1.10.6 Installing the N8117-01A expansion RS-232C connector kit

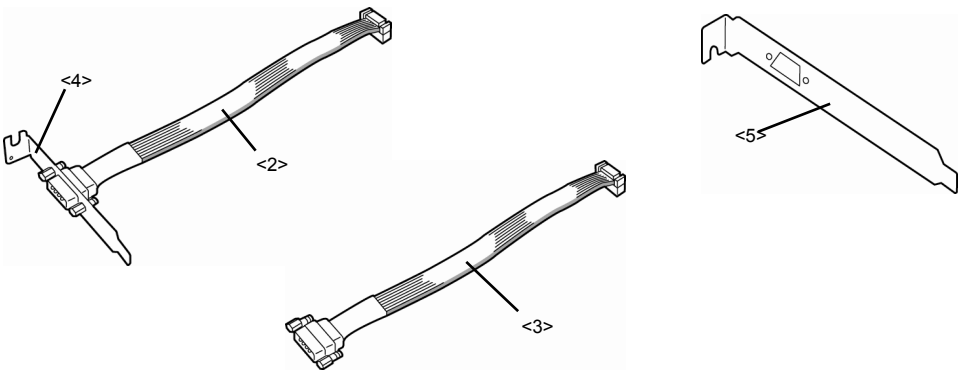
Install a PCI card to connect to the PCI slot by using the following procedure. For details, refer to the instruction manual supplied with the connector kit.

Important **The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).**

Tips N8117-01A extra RS-232C connector kit is only supported by air-cooled models. It cannot be installed in water-cooled models.

The component parts for N8117-01A are as follows:

Item no.	Item name	Specification	Amount	Remarks
<1>	RS-232C connector kit manual	856-125671-002	1	
<2>	RS-232C cable (A)	804-063264-020	1	
<3>	RS-232C cable (B)	804-062746-820	1	
<4>	PCI bracket (1)	243-112122-001	1	Preinstalled to cable
<5>	PCI bracket (2)	243-112122-002	1	For full height PCI

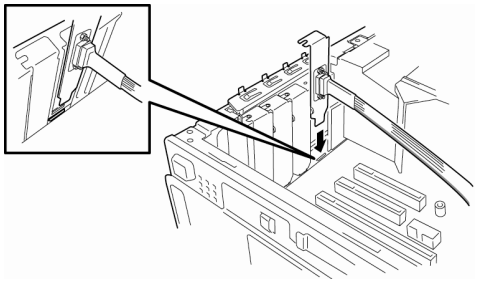


This product uses a combination of items <3> and <4>.

Follow the procedure below to install the kit.

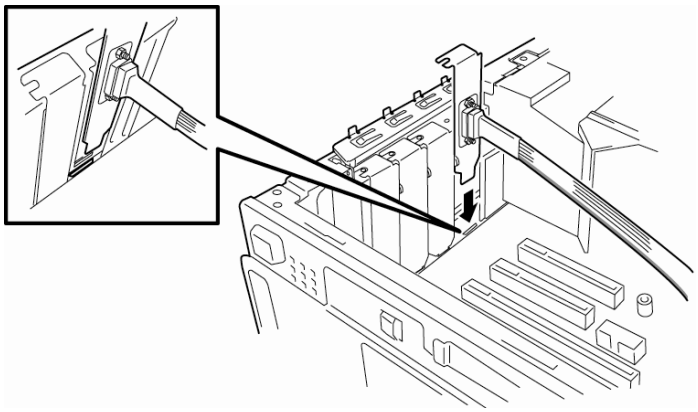
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover while referring to *Chapter 2 (1.4 Removing the Side Cover)*.
3. Assemble <3> RS-232C cable (B) and <4> PCI bracket (1).
4. Open the PCI slot retention while referring to *Chapter 2 (1.10.3 Installation)*.

5. Remove the expansion slot cover aligned with the slot where you are going to install a card.



Important **Keep the removed slot cover for future use.**

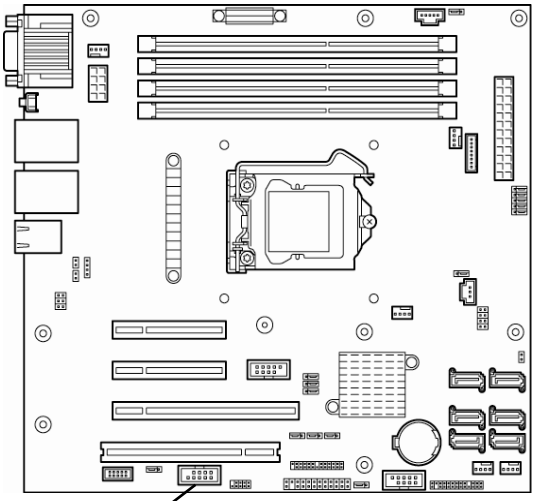
6. Make sure that you are properly inserting the bracket edge into the frame guide, and attach it securely.



7. Bend the cable so as not to buffer other PCI cards, and connect to the COM connector used for internal connections in the motherboard.
Refer to the following for the position of the COM connector for internal connections.

Important

- **If connecting the cable, fit it to the polarizing key of the connector and be careful not to connect it improperly.**
- **The N8117-01A expansion RS-232C connector kit contains two types of cables. This server uses the RS-232C cable (B).**



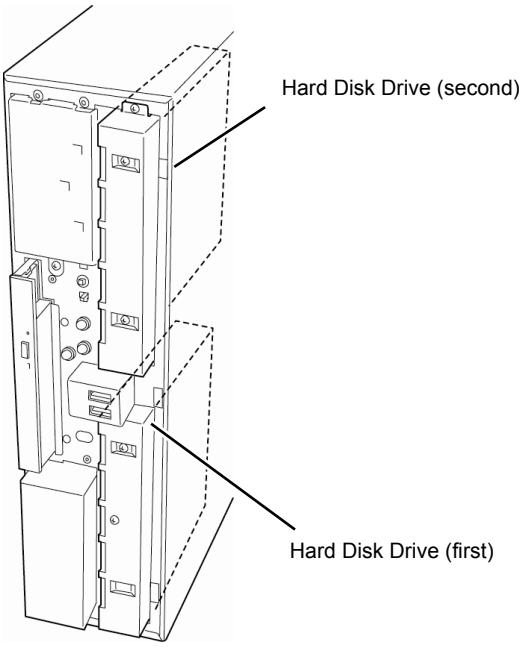
COM connector for internal connections

8. Make sure that no removed slot covers, tools, screws, or other similar objects remain inside, and assemble.

1.11 3.5-inch Hard Disk Drive

Up to 2 SATA Hard Disk Drives can be installed in the 3.5-inch Hard Disk Drive model.

Important **Use Hard Disk Drives specified by NEC. Installing a third-party Hard Disk Drive might cause a failure of the server and the Hard Disk Drive. You will be charged for maintenance for failures and damage caused by these products, even during the maintenance period.**

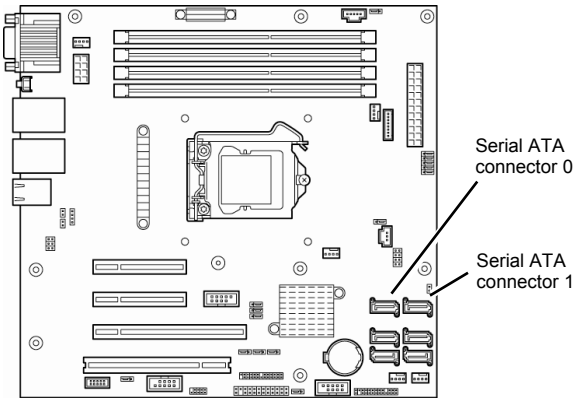


1.11.1 Installation

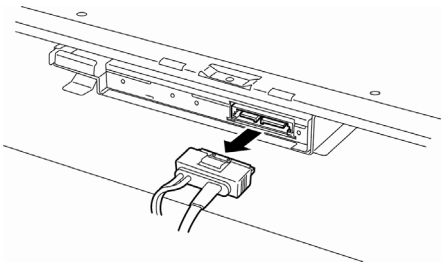
Follow the procedure below to install the 3.5-inch Hard Disk Drive.

1. Refer to the manual provided with the Hard Disk Drive before installation, and specify the settings of the Hard Disk Drive.

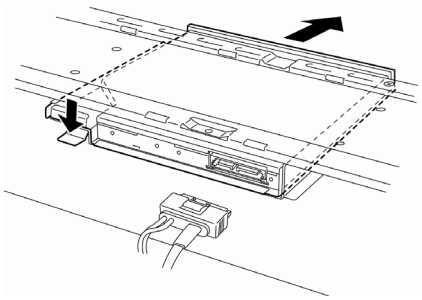
Number of additional drives	Location of the bay where the drives will be installed	Serial ATA connector of the connecting motherboard
1	Bottom	Serial ATA connector 0
2	Top	Serial ATA connector 1



2. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
3. Remove the side cover and front bezel while referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel)*
4. Disconnect the optical disk drive cable.

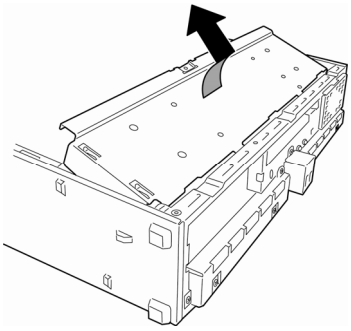


5. While pressing the stopper on the left, remove the optical disk drive.

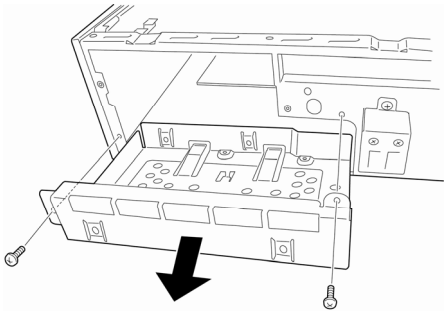


6. If the 3.5-inch device is attached, remove the cable and then remove the device.
For details, refer to *Chapter 2* (*1.14 Backup devices*).

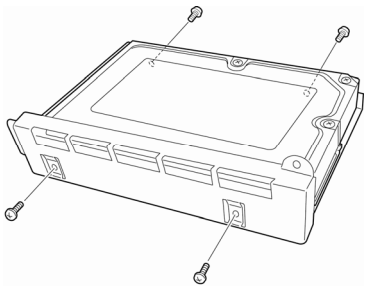
7. Lift the rear part of the sub frame to remove the sub frame.



8. Remove the two screws and remove the 3.5-inch Hard Disk Drive tray.
If you intend to install two Hard Disk Drives, repeat the following procedure for the second unit.

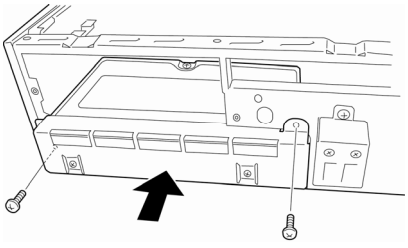


9. Attach the Hard Disk Drive tray to the Hard Disk Drive with the provided four screws (screw set 505).



Important **Use the screws that were provided by this device (screw set 505 of four screws) to secure the Hard Disk Drive. Using screws of a length greater than that required can cause damage to the Hard Disk Drive.**

10. Install the Hard Disk Drive in the server and connect the interface cable and power cable. Then, fix it with the designated two screws.



Note

- Use the SATA cable supplied with the server. To connect the SATA cable, connect the right angle connector to the motherboard side and the straight connector to the Hard Disk Drive side.
- The cable to be used varies depending on the controller type to which it will connect. For details, refer to *Chapter 2* (*1.15 Connecting cables)*.

11. Assemble the server.

12. Run the BIOS setup utility and confirm that the Hard Disk Drive is properly recognized from BIOS (refer to *Chapter 3* (*2. System BIOS Setup*)).

1.11.2 Removal

You can remove the Hard Disk Drive by using the following procedure.

Important

Data on Hard Disk Drives
You are responsible for erasing sensitive data including customer information or financial information of your company stored in the removed Hard Disk Drives so that such data will not be disclosed to a third party.
The data seems to be erased using the "Empty recycle bin" operation in Windows or the format command of the OS, but the actual data remains in Hard Disk Drives. Data which is not yet completely erased can be recovered by using special software and reused by unauthorized parties.
To avoid such problems, it is strongly recommended that you use commercial software or services to securely erase data. For information on erasing data, contact the store where you purchased the product or your maintenance service company.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover and front bezel while referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel)*.
3. Take out the 3.5-inch Hard Disk Drive tray with the Hard Disk Drives installed, referring to steps 3 to 9 in *Chapter 2 (1.11.1 Installation)*.
4. Remove the Hard Disk Drive while referring to step 10 in *Chapter 2 (1.11.1 Installation)*.
5. Assemble the server.

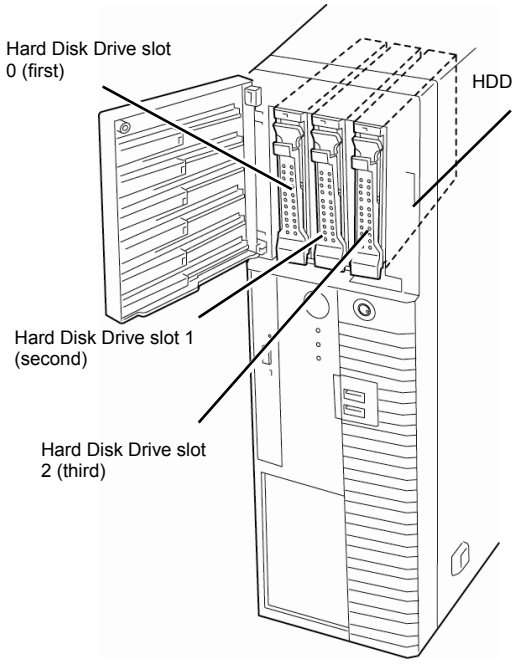
1.12 2.5-inch Hard Disk Drive

The standard number of SAS/SATA Hard Disk Drives or solid state drives (SSDs) you can install in a 2.5-inch Hard Disk Drive is three, and the maximum is five.

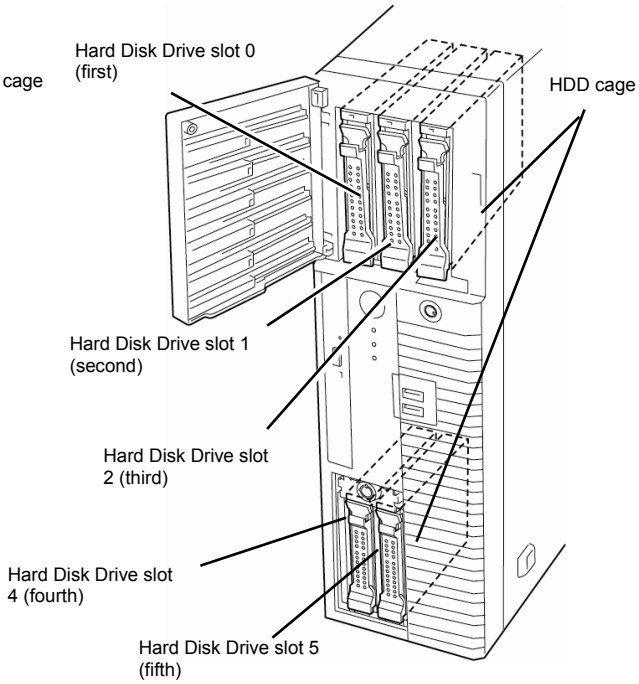
Combining SATA/SAS Hard Disk Drives and SSDs

- Hard Disk Drives (SATA/SAS) and SSDs cannot be combined on BTO servers.
- A RAID Controller option must be prepared to use SAS Hard Disk Drives together with SSDs.
- You cannot mix them within the same RAID group (Disk Array).
- You cannot use a combination of Hard Disk Drives that have differing rotation speeds for SAS Hard Disk Drives.
- Mount SATA/SAS Hard Disk Drives in order from slot 0, and mount the SSDs to the remaining slots.
- You can use a combination of an SAS Hard Disk Drive in the standard cage and an SATA Hard Disk Drive in the expansion cage.

Important **Use Hard Disk Drives specified by NEC. Installing a third-party Hard Disk Drive might cause a failure of the server and the Hard Disk Drive. You will be charged for maintenance for failures and damage caused by these products, even during the maintenance period.**



(When 3 Hard Disk Drives are installed)



(When 5 Hard Disk Drives are installed)

Important **Mount Hard Disk Drives in order from slot 0 without skipping slots.**

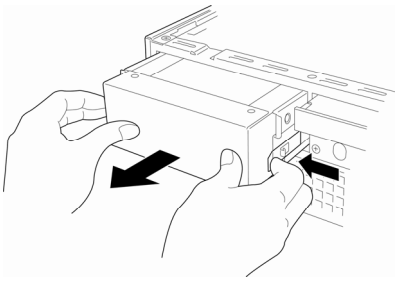
1.12.1 Installing an expansion 2.5-inch HDD cage

For 2.5-inch Hard Disk Drive models, you can install an additional two Hard Disk Drives by using a 2.5-inch HDD cage.

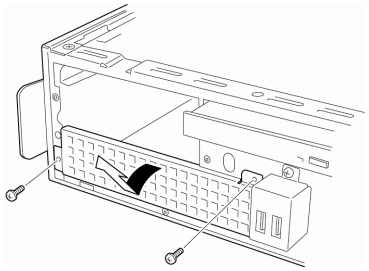
Tips An expansion 2.5-inch HDD cage is only supported by air-cooled models.

Install the 2.5-inch HDD cage for additional drives by using the following procedure.

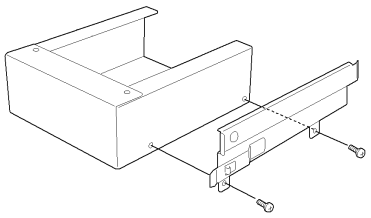
1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover and front bezel while referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel)*.
3. Pull the blank panel toward you while pressing the tab on the right.



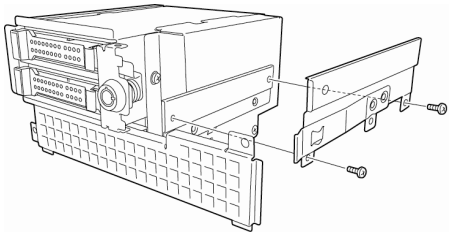
4. Remove the two screws from the blank cover.



5. Remove the two screws from the blank panel and detach the rails.

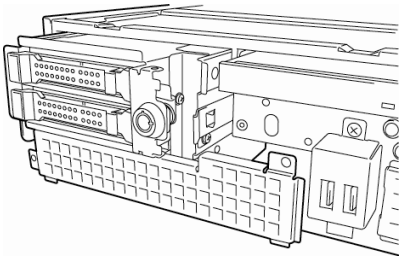


6. Attach the rails you removed in step 5 to the HDD cage. Use the screws you removed from the blank panel.

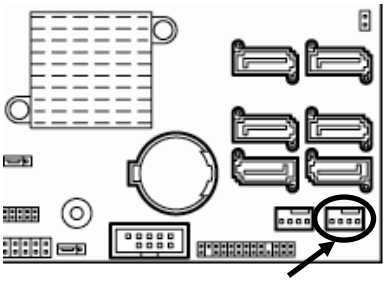


Important **Keep the removed blank panel for future use.**

7. Push the HDD cage halfway in the server. Do not push the cage in completely as the cable has to be connected to the device.

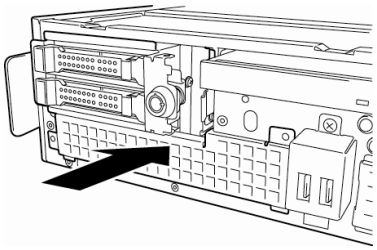


8. Connect the fan cable of the HDD cage to the motherboard. For details, refer to *Chapter 2* (*1.15 Connecting cables)*.

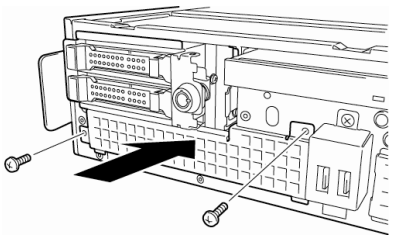


Connector of the motherboard to be connected (FAN 4)

9. Push the HDD cage all the way into the server until it locks with a clicking sound.



10. Use screws to fix the blank cover to the HDD cage attached in step 9. Use the screws you removed earlier.

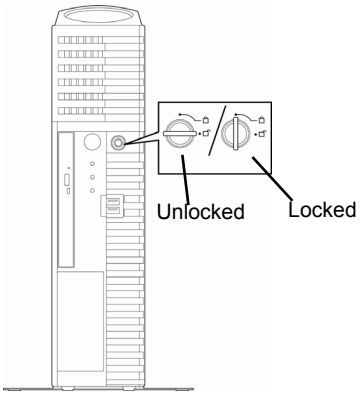


11. Connect cables. For details, refer to *Chapter 2 (1.15 Connecting Cables)*.

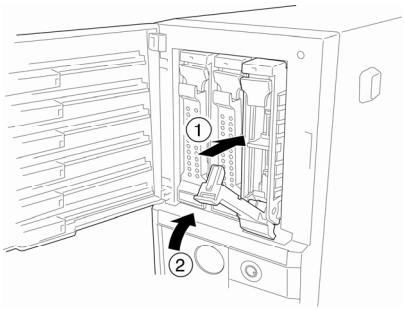
1.12.2 Installation

Follow the procedure below to install the 2.5-inch Hard Disk Drive.

1. Unlock the security key and open the door of the Hard Disk Drive bay.



2. Install the Hard Disk Drive in the HDD cage. With the handle of the Hard Disk Drive tray fully open, insert the Hard Disk Drive all the way into the HDD cage.
After the insertion, close the lever to fix the Hard Disk Drive into place (②) (It is locked when you hear a clicking sound.)



Important **Use Hard Disk Drives recommended by NEC.**
For details, consult with the store where you made your purchase or your maintenance service company.

Note Refer to the image and confirm that the Hard Disk Drive (tray) is oriented correctly before insertion. Also make sure that the lever hook engaged with the HDD cage frame when the lever is closed.

3. Securely hold the tray and handle, and attach it to the HDD cage so that it is straight.

Important **Removing more than one Hard Disk Drive while the server is powered on will break the logical disk. Remove or replace drives one by one.**

4. Close the 2.5-inch Hard Disk Drive bay and lock with the security key.

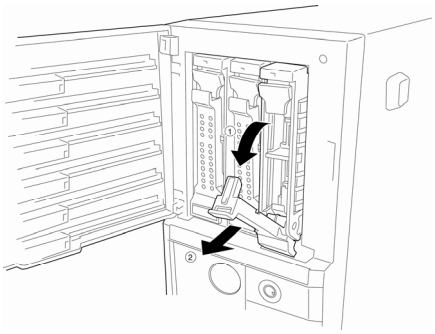
1.12.3 Removal

You can remove the Hard Disk Drive by using the following procedure.

Important

Data on Hard Disk Drives
You are responsible for erasing sensitive data including customer information or financial information of your company stored in the removed Hard Disk Drives so that such data will not be disclosed to a third party.
The data seems to be erased using the "Empty recycle bin" operation in Windows or the format command of the OS, but the actual data remains in Hard Disk Drives. Data which is not yet completely erased can be recovered by using special software and reused by unauthorized parties.
To avoid such problems, it is strongly recommended that you use commercial software or services to securely erase data. For information on erasing data, contact the store where you purchased the product or your maintenance service company.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Unlock the security key and open the door of the 2.5-inch Hard Disk Drive bay.
3. Remove the Hard Disk Drive while referring to steps 2 in *Chapter 2 (0*
4. Installation*)*.
5. Close the 2.5-inch Hard Disk Drive bay and lock with the security key.



1.12.4 Removing the 2.5-inch HDD cage for additional drives

You can remove the 2.5-inch HDD cage for additional drives by using the following procedure.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover and front bezel while referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel)*.
3. Referring to *Chapter 2, (1.12.3*

Removal) of this document, remove all Hard Disk Drives installed in the 2.5-inch HDD cage for additional drives.

4. Referring to *Chapter 2 (1.12.1 Installing an expansion 2.5-inch HDD cage)*, remove the HDD cage by reversing the installation procedure.
5. If using the server with the HDD cage removed, attach the blank panel you have put aside.

1.13 Optical Disk Drive

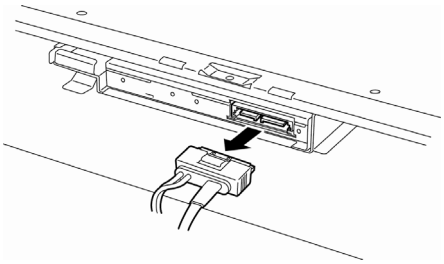
Procedures for replacing the standard optical disk drive with the optional internal DVD SuperMULTI drive are described below.

Important **Do not install a drive other than those specified by NEC.**

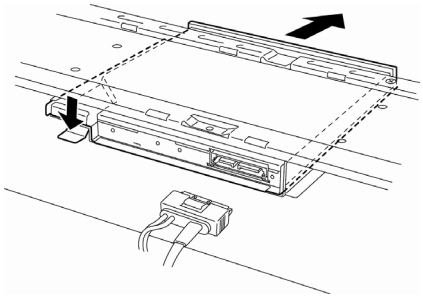
1.13.1 Replacing drives

Follow the procedure below to replace your drive with the optional internal DVD SuperMULTI drive.

1. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
2. Remove the side cover and front bezel while referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel)*.
3. While pressing the latch of the SATA cable, disconnect the SATA cable from the optical disk drive.



4. While pressing the stopper which is situated on the left when you look at from the rear, remove the optical disk drive from the server.



5. Remove the optical disk drive from the dedicated bracket.
6. Install the DVDSuperMULTI drive to the bracket for optical disk drive from which you removed the optical disk drive in step 5.
7. Install the bracket with DVDSuperMULTI drive installed to the server.
8. Connect the SATA cable you disconnected in step 4 to the server.

This completes the installation procedures.

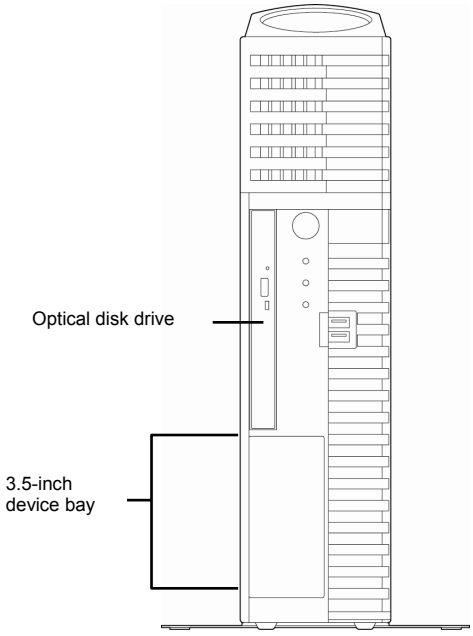
1.13.2 Removal

You can remove the optical disk drive by reversing the installation procedure.

1.14 Backup devices

This server contains slots for the installation of backup devices, such as optical disk drives and magnetic tape drives. As a standard, there is one expansion slot.

Tips Controller board options and internal cables might be required depending on the devices installed. For more information, refer to *Chapter 2 (1.15 Connecting cables)*.



1.14.1 Installation

Install a backup device by using the following procedure. The procedure will be described, focusing on installing the SCSI file device option.

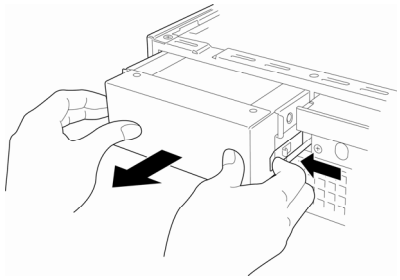
1. Specify the settings of the device.
   The settings for the device to be installed to the device bay is as follows:

Device	Settings
SCSI device	Termination resistor OFF*

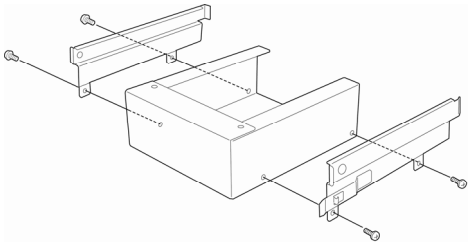
* Because the internal SCSI cable K410-181(00) available as an option is attached to the terminator, set the termination resistance of the device to OFF.

Important **If a SCSI device is installed, specify an SCSI ID that is not already used by another external SCSI device that is connected to the same controller.**

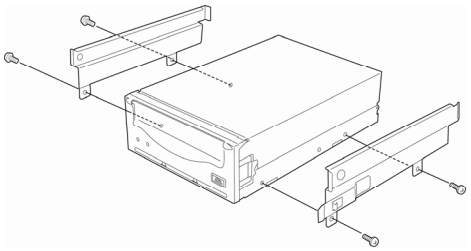
2. Refer to *Chapter 2 (1.3 Overview of Installation and Removal)* for preparations.
3. Remove the side cover and front bezel while referring to *Chapter 2 (1.4 Removing the Side Cover* and *1.5 Removing the Front Bezel)*.
4. While pressing the tab on the right, pull the blank panel out.



5. Remove the four screws from the blank panel and detach the rails.

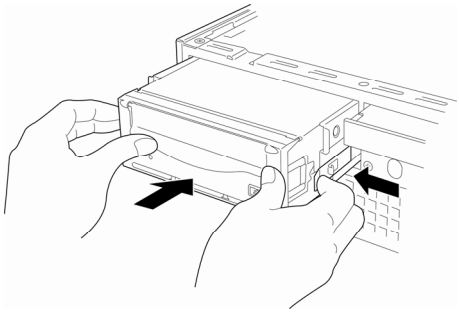


6. Attach the rails to the backup device.



Important
- **Keep the removed blank panel for future use.**
- **Use screw set 502 supplied with this server to attach the rails to the backup device.**

7. Do not push the backup device in completely as the cable has to be connected to the device.



8. Connect the interface cable and power cable to the installed 3.5-inch device.
   For more information, refer to *Chapter 2* (*1.15 Connecting cables)*.
9. Push the device all the way until it locks with a clicking sound.
10. Assemble the server.
11. For SCSI devices, use the BIOS utility of the SCSI controller and specify the transfer rate and other settings.
    For more information, refer to the manual provided with the SCSI controller.
12. Install device drivers for installed devices as needed.
    For more information, refer to the manual provided with the device.

1.14.2 Removal

You can remove the backup device by reversing the installation procedure. If the devices are to remain removed, attach the stored blank panel.

1.15 Connecting cables

This section shows an example of internal device cable connection.

1.15.1 Interface cables

This section describes the connection of interface cables.

Tips The figure shown here primarily describes connections. For more information about the connectors on the motherboard, refer to *Chapter 1 (5.4 Motherboard)*.

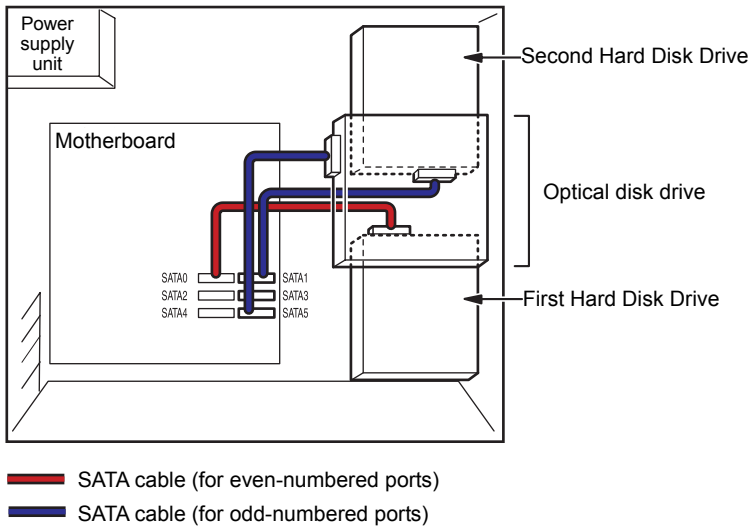
(1) Connecting Hard Disk Drives

This section describes how to connect additional Hard Disk Drives.

(a) For 3.5-inch Hard Disk Drive models

When adding Hard Disk Drives, connect the cables as in the following figure. Install the Hard Disk Drives in order from the bottom.

Connect the first Hard Disk Drive to SATA0, the second to SATA1.

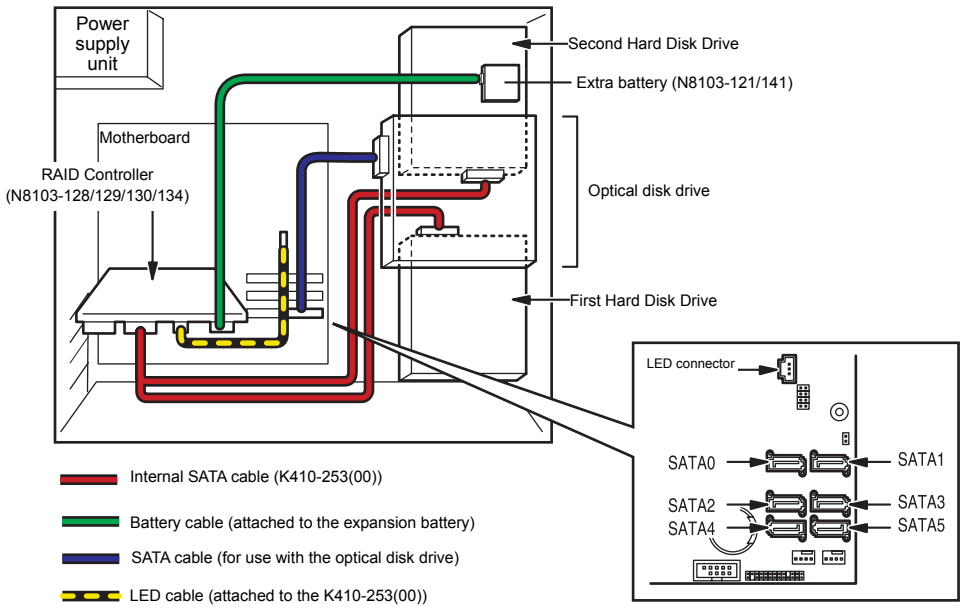


Note To connect the SATA cable, connect the right angle connector to the motherboard side and the straight connector to the Hard Disk Drive side.

You can use the controller on the motherboard to build a RAID System. For more information on the RAID level you can build and then method for building RAID Systems, see *Chapter 2 (4. RAID System Configuration)* in "*Maintenance Guide*".

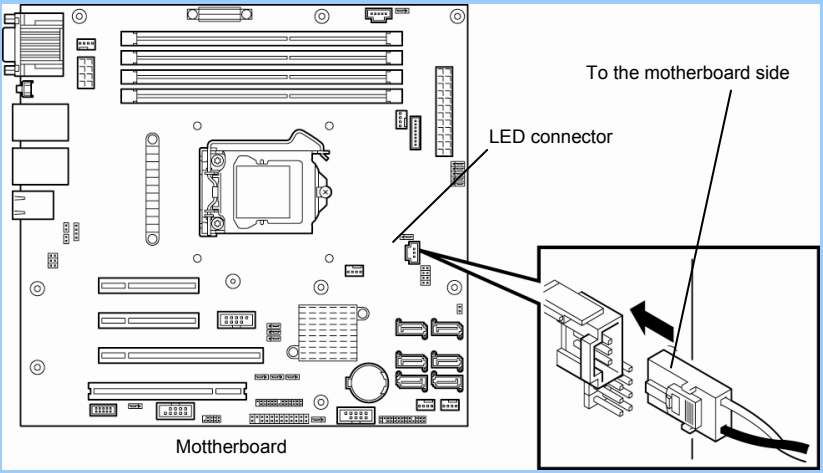
- **If a RAID Controller (N8103-128/129/130/134) has been added**

  Connecting to a RAID Controller (N8103-128/129/130/134) requires a dedicated cable (K410-253(00)) for use with RAID Controllers. Install the Hard Disk Drives in order from the bottom.



Important

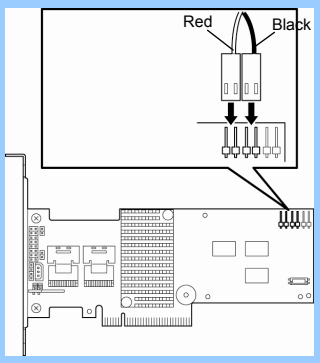
- **SAS Hard Disk Drives and SATA Hard Disk Drives cannot be combined.**
- **About RAID LED cables**
  The DISK access LED on the front of the equipment shows the access status of Hard Disk Drives that are connected to a RAID Controller. To display this status, connect the LED cable provided with the optional K cord cable K410-253(00).
  Connect the LED connector on the motherboard to the connector on the RAID Controller.



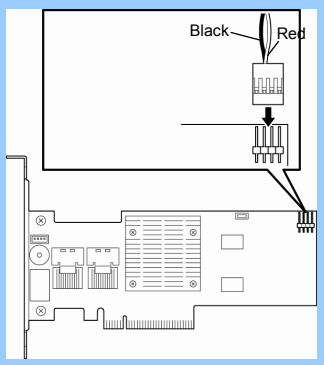
Refer to the figures below and connect the LED cable to the LED connector of the motherboard.

Connect the opposite end of the cable to connect to the RAID Controller.

RAID Controller N8103-129/130



RAID Controller N8103-128/134

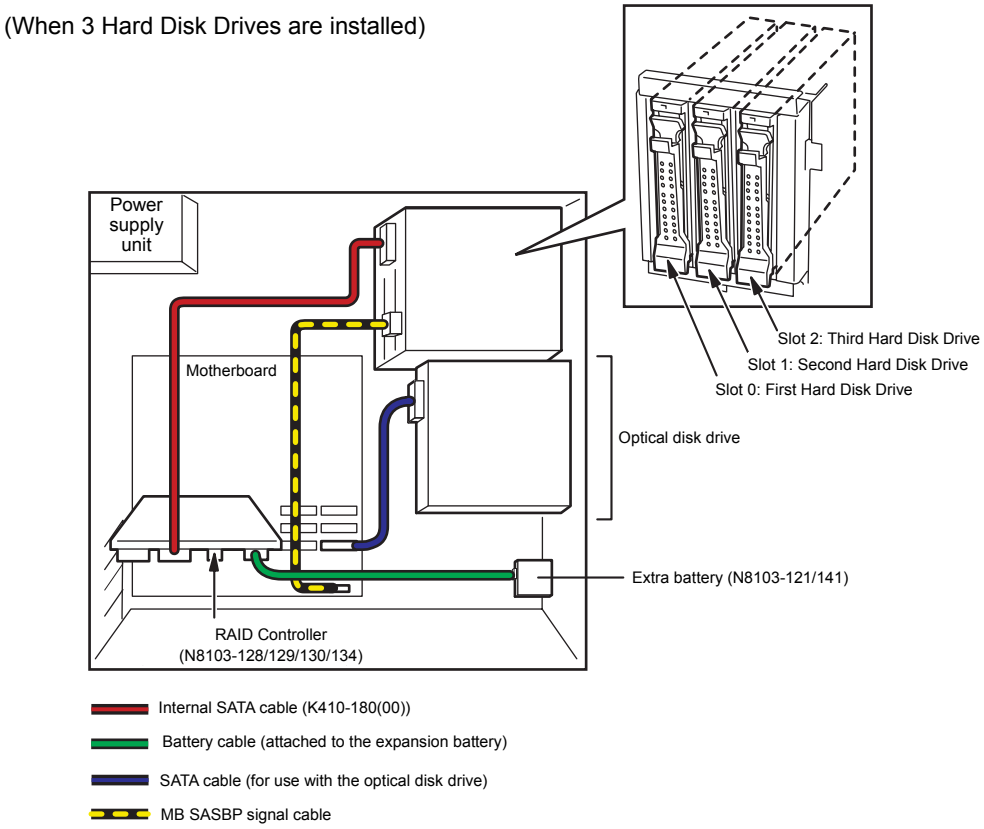


(b) For 2.5-inch Hard Disk Drive models

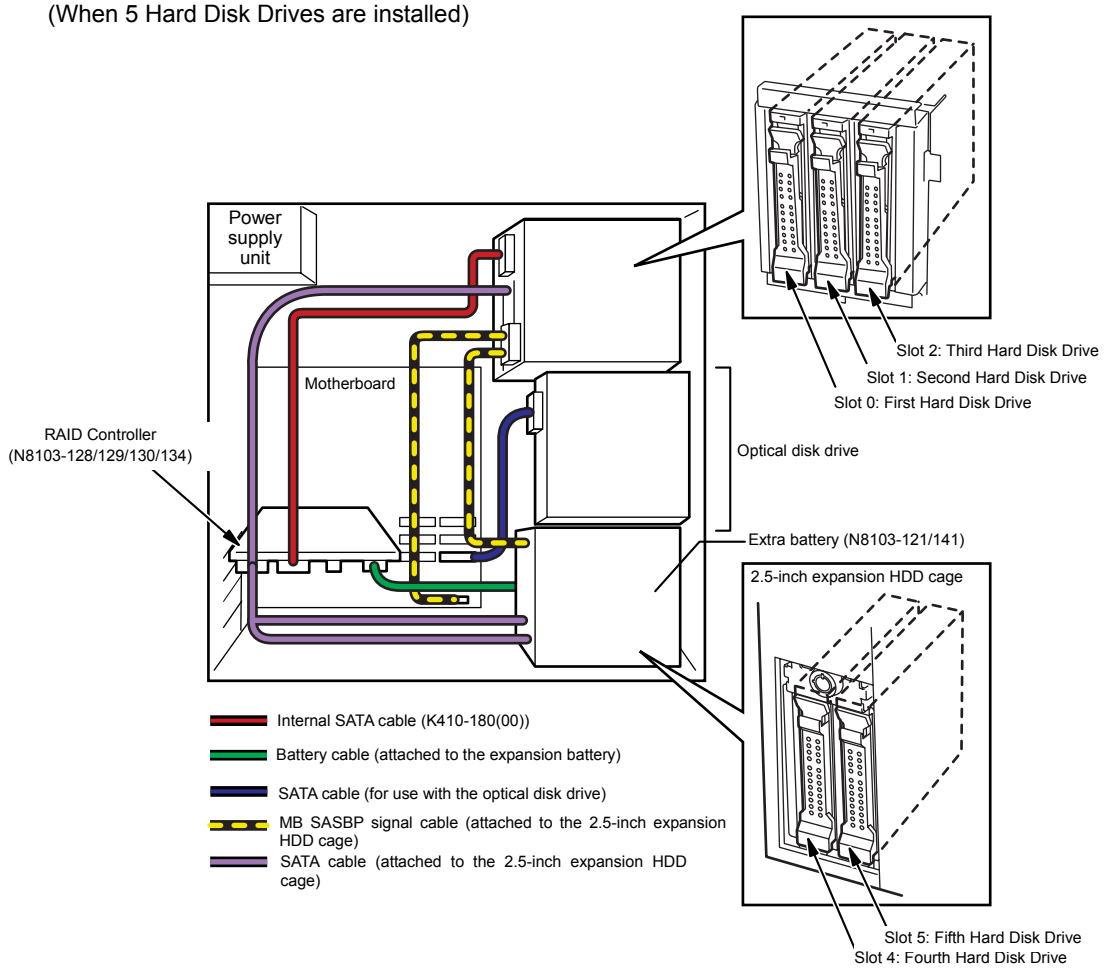
- **If a RAID Controller (N8103-128/129/130/134) has been added**

  If SAS or SATA Hard Disk Drives are installed and used in a RAID System with a RAID Controller (N8103-128/129/130/134), the dedicated cable K410-180(00) is required. Install Hard Disk Drives from Slot 0 in ascending order.

(When 3 Hard Disk Drives are installed)


Power supply unit
Motherboard
Slot 2: Third Hard Disk Drive
Slot 1: Second Hard Disk Drive
Slot 0: First Hard Disk Drive
Optical disk drive
Extra battery (N8103-121/141)
RAID Controller (N8103-128/129/130/134)
Internal SATA cable (K410-180(00))
Battery cable (attached to the expansion battery)
SATA cable (for use with the optical disk drive)
MB SASBP signal cable

(When 5 Hard Disk Drives are installed)


Power supply unit
Motherboard
RAID Controller (N8103-128/129/130/134)
Optical disk drive
Extra battery (N8103-121/141)
2.5-inch expansion HDD cage
Slot 2: Third Hard Disk Drive
Slot 1: Second Hard Disk Drive
Slot 0: First Hard Disk Drive
Slot 5: Fifth Hard Disk Drive
Slot 4: Fourth Hard Disk Drive
Internal SATA cable (K410-180(00))
Battery cable (attached to the expansion battery)
SATA cable (for use with the optical disk drive)
MB SASBP signal cable (attached to the 2.5-inch expansion HDD cage)
SATA cable (attached to the 2.5-inch expansion HDD cage)

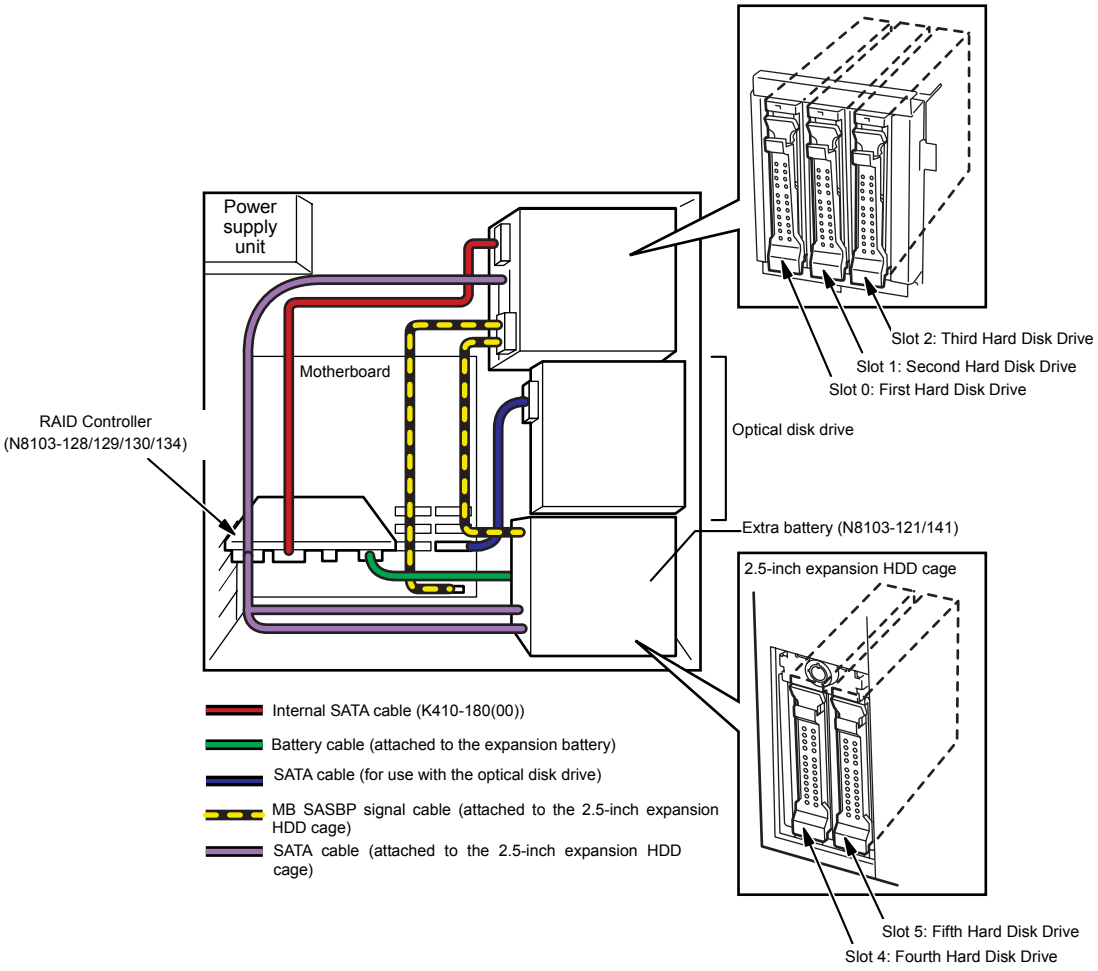
Tips

- N8154-37 2.5-inch HDD cage for additional drives cannot be installed in water-cooled models.
- LED cables attached to the K410-180(00) are not used.

- **If connecting a SATA Hard Disk Drive or solid state drive to an onboard SATA controller**

  To connect a SATA Hard Disk Drive or solid state drive (hereinafter referred to as *Hard Disk Drive*) to the SATA controller, the dedicated cable K410-241(00) is required. Connect cables as instructed in the image below. Match the number on the SATA connector of the cable with the SATA connector number on the motherboard. Also connect the cable to the SGPIO connector on the motherboard.
  Install Hard Disk Drives from Slot 0 in ascending order.

(When 3 Hard Disk Drives are installed for onboard connection)


Power supply unit
Motherboard
RAID Controller (N8103-128/129/130/134)
Optical disk drive
Extra battery (N8103-121/141)
2.5-inch expansion HDD cage
Slot 2: Third Hard Disk Drive
Slot 1: Second Hard Disk Drive
Slot 0: First Hard Disk Drive
Slot 5: Fifth Hard Disk Drive
Slot 4: Fourth Hard Disk Drive
Internal SATA cable (K410-180(00))
Battery cable (attached to the expansion battery)
SATA cable (for use with the optical disk drive)
MB SASBP signal cable (attached to the 2.5-inch expansion HDD cage)
SATA cable (attached to the 2.5-inch expansion HDD cage)

(When 5 Hard Disk Drives are installed)

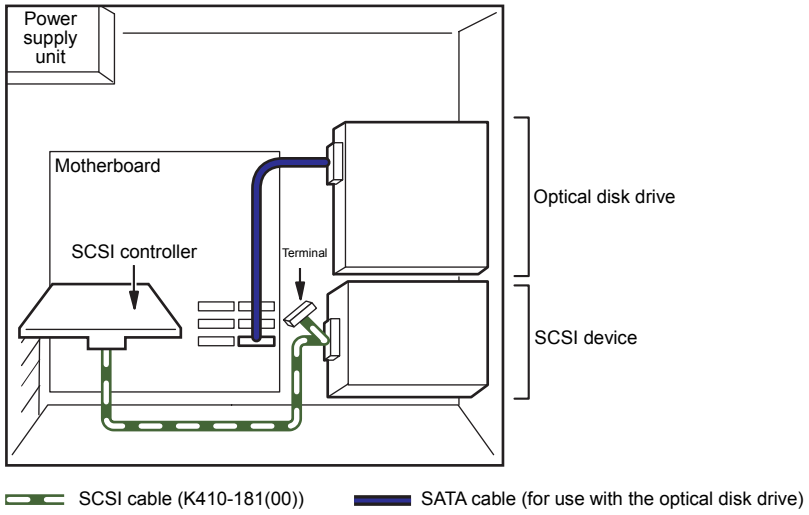
To install five Hard Disk Drives, a RAID Controller is required. You cannot connect them to the on-board SATA controller.

(2) Connecting 3.5-inch devices

You can mount SCSI devices, SAS devices, and USB devices (for internal connections) to 3.5-inch devices.

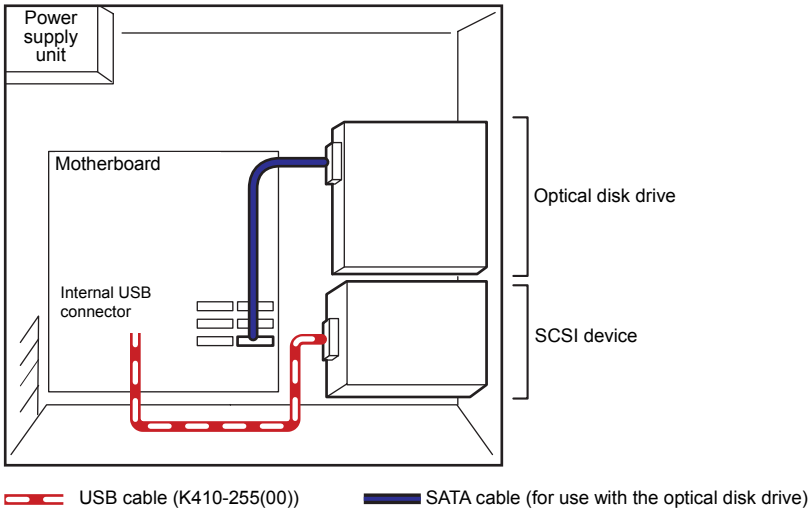
(a) If mounting an SCSI device

Use SCSI cable K410-181(00) with an SCSI controller to connect the SCSI device. Set an SCSI ID that is not already set as the ID for another SCSI device. Because a connector for terminating SCSI connections is installed in SCSI cable K410-181(00), specify the termination settings of the 3.5-inch device to **Disabled**.



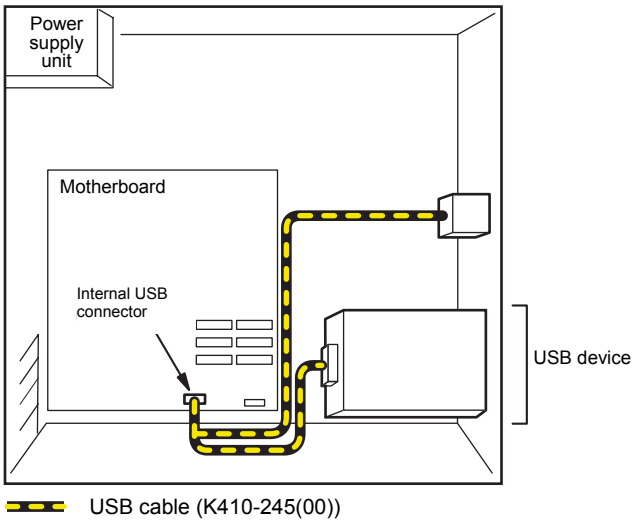
(b) If mounting an internal USB device

Use the dedicated internal USB cable K410-255(00).



(c) If using the front USB connector when mounting the internal USB device

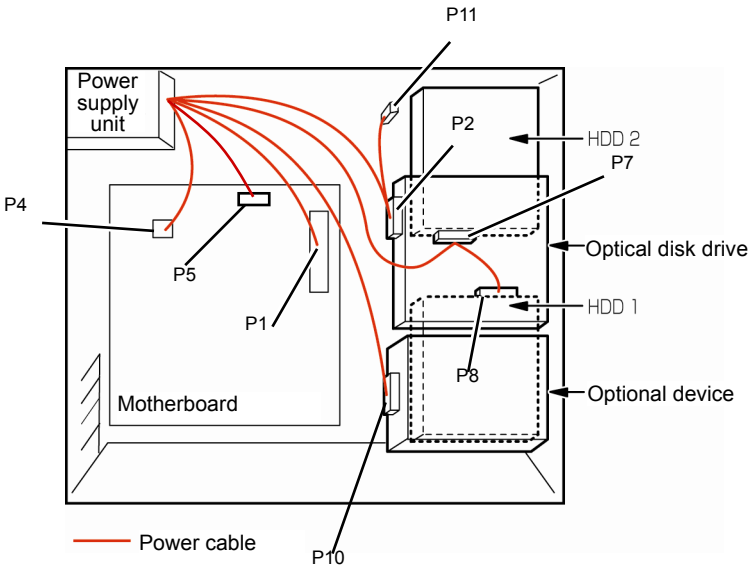
Use internal USB cable K410-245(00) to connect the device.



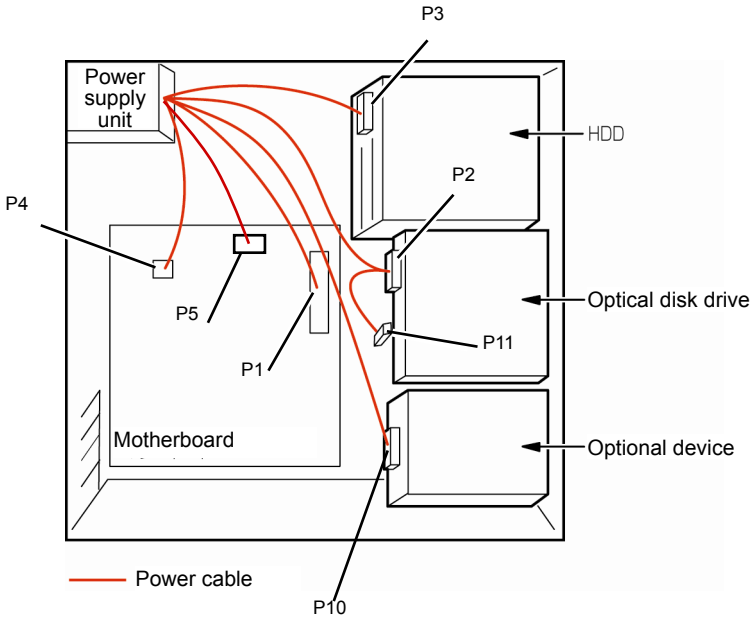
1.15.2 Power cables

The illustration below shows an example of connecting the power cables. Power cables other than those shown here are not used by the devices.

(1) For 3.5-inch Hard Disk Drive models

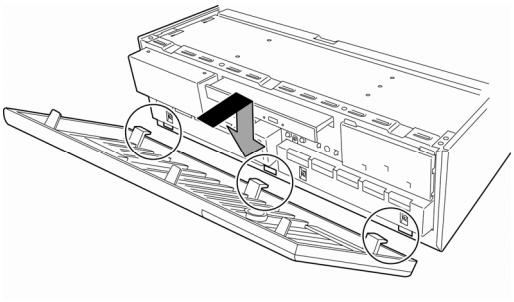


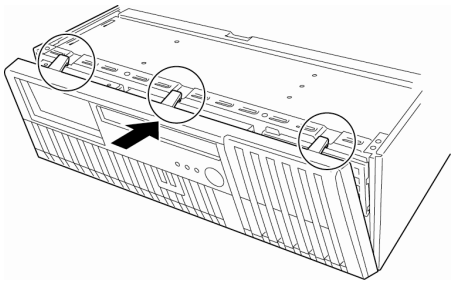
(2) For 2.5-inch Hard Disk Drive models



1.16 Attaching the Front Bezel

You can attach the front bezel by reversing the removal procedure. Insert the three tabs on the lower part of the front bezel into the holes on the front of the server and then push the upper part of the front bezel toward the server to lock with release tabs.

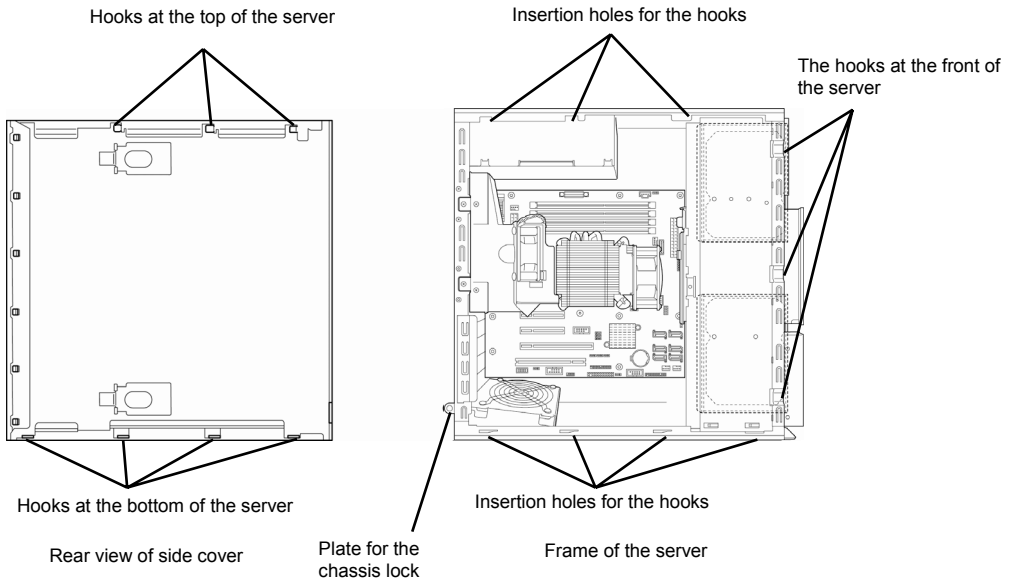




1.17 Installing the Side Cover

You can attach the side cover by reversing the removal procedure.

Make sure that hooks at both the top and bottom of the side cover are securely inserted in the holes on the server frame. Also make sure that the hooks at the front of the cover are engaged with the server frame when sliding the side cover forward to attach. If they are not engaged with the frame, the cover cannot be secured in place.


Hooks at the top of the server
Insertion holes for the hooks
The hooks at the front of the server
Hooks at the bottom of the server
Insertion holes for the hooks
Rear view of side cover
Plate for the chassis lock
Frame of the server

2. Ideal Location and Connection

This section describes how to position the server and connect cables.

2.1 Ideal location for the server

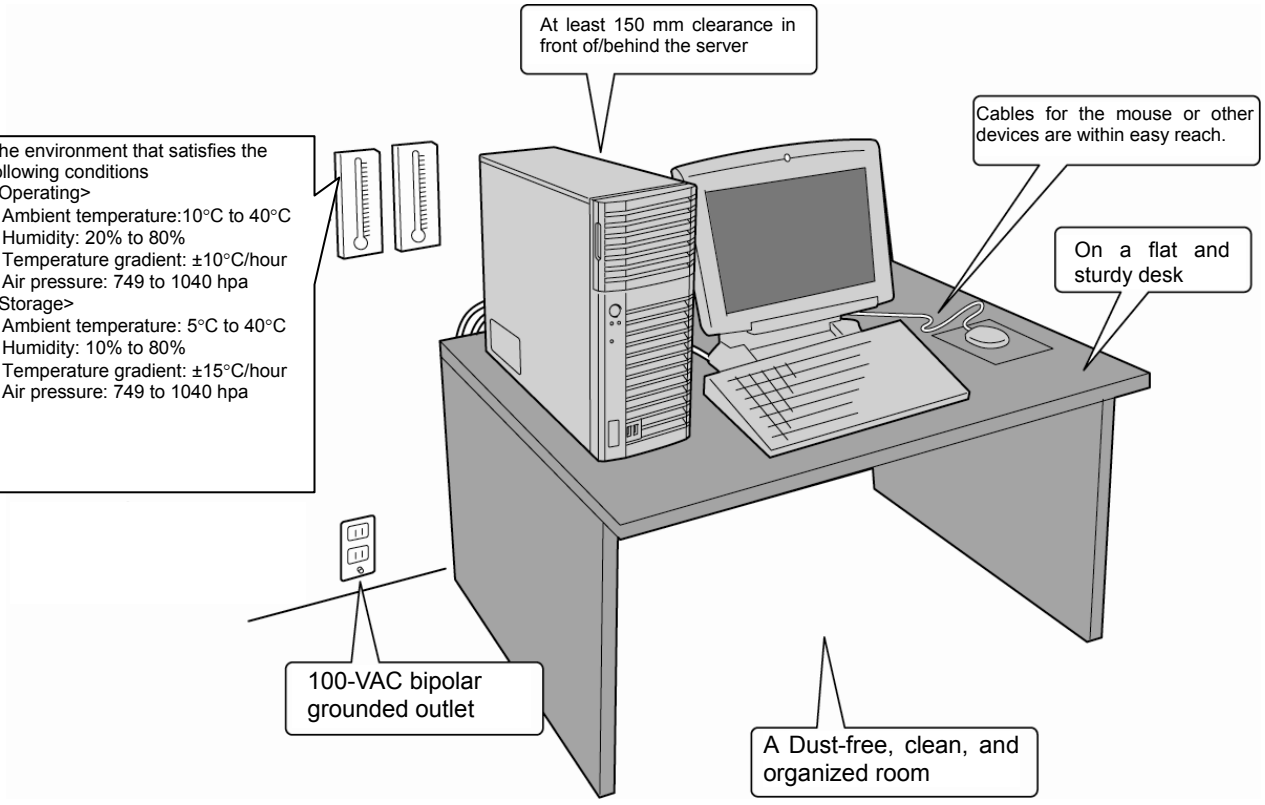
⚠ CAUTION

Be sure to observe the following precautions to use of the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

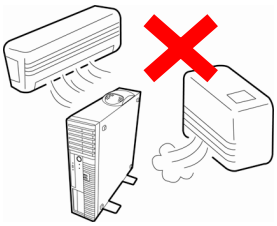
- **Do not attempt to lift the server by gripping the front bezel or air duct.**
- **Install and store only in the specified environment.**

The environment suitable for the server is as follows.

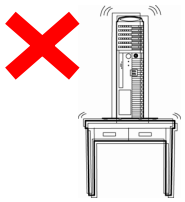
Hold the server firmly, and slowly and gently place it in the position in which it is to be installed.


At least 150 mm clearance in front of/behind the server
Cables for the mouse or other devices are within easy reach.
On a flat and sturdy desk
The environment that satisfies the following conditions
<Operating>
Ambient temperature:10°C to 40°C
Humidity: 20% to 80%
Temperature gradient: ±10°C/hour
Air pressure: 749 to 1040 hpa
<Storage>
Ambient temperature: 5°C to 40°C
Humidity: 10% to 80%
Temperature gradient: ±15°C/hour
Air pressure: 749 to 1040 hpa
100-VAC bipolar grounded outlet
A Dust-free, clean, and organized room

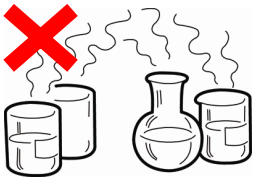
Do not install the server in an environment in which any of the following conditions apply: Installing the server in any of the following conditions will cause the server to malfunction.



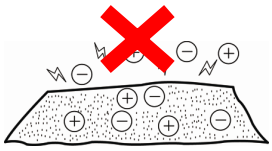
Place of drastic temperature change (near a heater, air conditioner, or refrigerator).



Place where intense vibration may be generated.

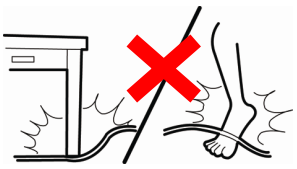


Places where corrosive gas is present (environments where there is sulfur vapor in the atmosphere), or places where chemicals are nearby or may be accidentally sprayed over.

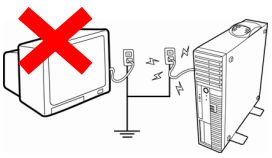


Place where a carpet not subject to anti-static process is laid.

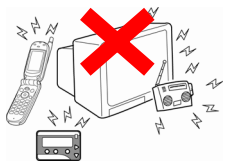
Place where some objects may be fallen.



Places where the power cords or interface cables might be stepped on or tripped over.



Place where the power cord of the server must be connected to an AC outlet that shares the ground wire with another outlet where another device with large power consumption is connected.



Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed.

Do not install where there is power supply noise nearby (such as contact sparks when turning power on or off during power relays). (If you must install the server close to such equipment, have your maintenance service company separate power cables or install noise filter.)

2.1.1 Preparation for installation

(1) For vertical mounting

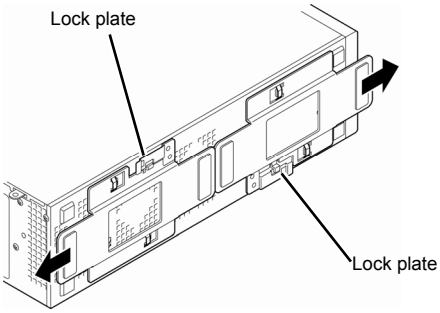
For vertical use of the server, the stabilizer attached to the bottom of the server must be removed to change the orientation as instructed below.

Also be sure to attach the air duct for cooling on the top of the server.

(a) Removing/installing the stabilizer

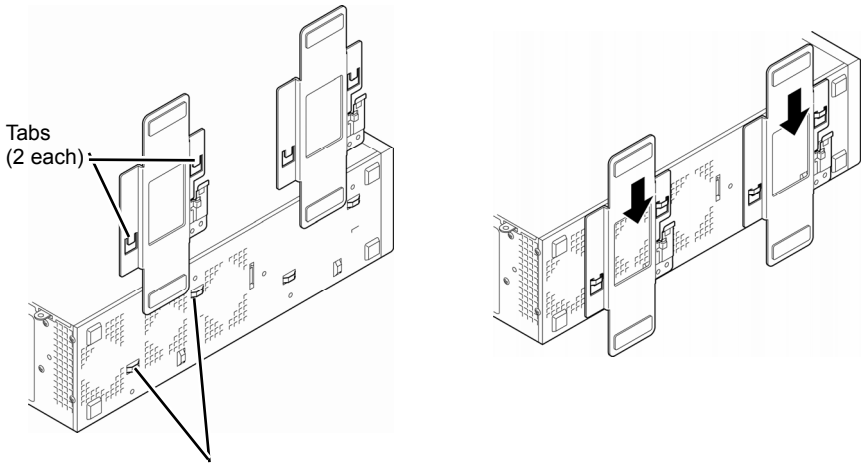
Removing the stabilizer

Release the lock plate and slide it in the direction of the arrow to remove.

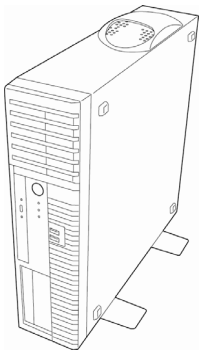


Installing the stabilizer

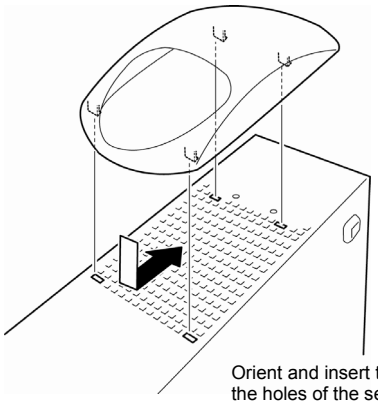
Insert the tab of the stabilizer into the slot of the server as shown in the image below.



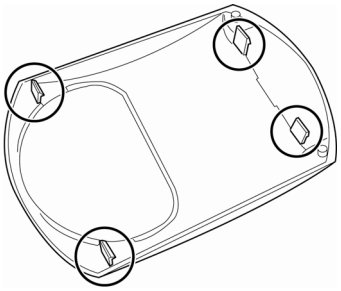
After attaching the stabilizers, set up the server as shown in the image.



(b) Installing the air duct



Orient and insert the 4 tabs into the holes of the server.

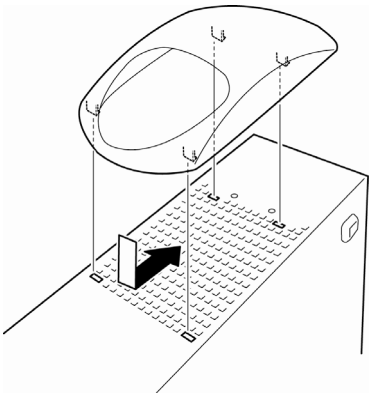


Tabs on the air duct (4 tabs)

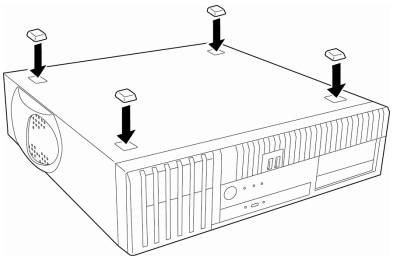
Important **To maintain the cooling effect in the server, be sure to attach the air duct. Do not install the server in an area where the vent side might be blocked by walls or objects.**

(2) For horizontal mounting

To mount the server horizontally, attach the provided rubber feet to the positions shown in the image. Also attach the air duct on the right side of the server (the server top if vertically mounted).



Insert the four tabs in the grooves of the unit.



Attach the rubber feet on the right side of the server as shown in the image.

Important

- **If the server is horizontally mounted, you may put devices that weigh less than 5 kg on the top of the server.**
- **To maintain the cooling effect, be sure to attach the stabilizer and air duct. Do not put any objects on the sides of the server.**

2.2 Connection

Connect peripheral devices to the server. Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. Images on the following pages show the peripheral devices that can be connected in their standard state and their respective connector positions. First connect the peripheral devices and then connect the power cord to the server. After that, connect the power plug to the outlet.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, refer to *Safety precautions* in *Precautions for Use*.

- **Do not hold the power plug with wet hands.**

CAUTION

Be sure to observe the following precautions to use of the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, refer to *Safety precautions* in *Precautions for Use.*

- **Use only the specified outlet to insert.**
- **Do not connect the power cord to an outlet that has an illegal number of connections.**
- **Insert the power plug into the outlet as far as it goes.**
- **Use only the specified power cord.**
- **Do not connect or disconnect the interface cable while the power cord is connected.**
- **Use only the specified interface cable.**

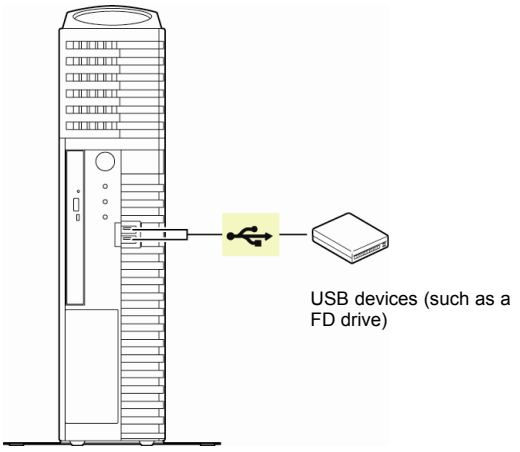
2.2.1 Interface cables

First connect the interface cable and then the power cord.

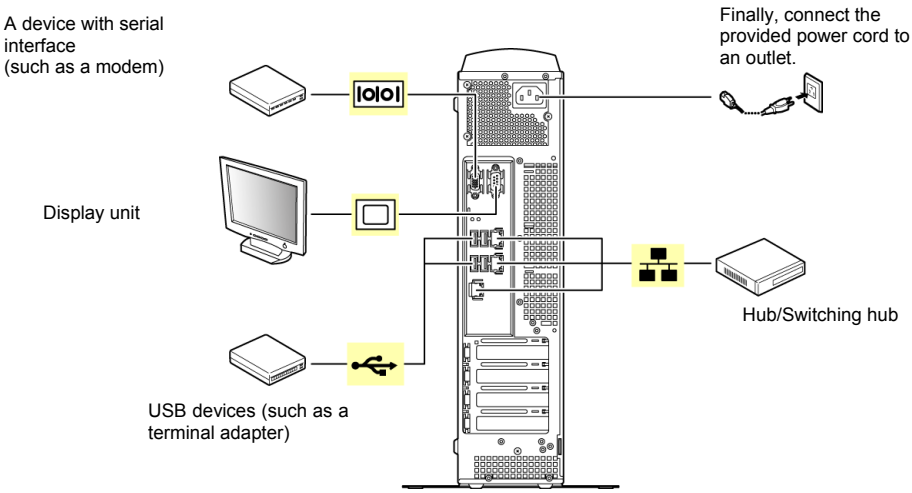
Important

- **Turn off the server and peripheral devices to be connected before connecting. Connecting wit power ON can cause malfunction or failure.**
- **If connecting any peripheral device and its interface cable made by a third party, contact the store where you purchased them to check if they can be used with the server beforehand. Some devices from a third party cannot be used with the server.**
- **You cannot connect directly to the dedicated line through the serial port that is equipped with the server as standard. To connect the dedicated line, use a terminal device that is certified according to the Telecommunication Business Law (a dedicated line means a dedicated communication facility or other facility allocated to one specific user). It includes a public line.)**
- **The connectors that are not explained here are not used. Do not connect anything to the connectors.**
- **Be sure to use the display unit specified by NEC. The operation is not guaranteed if you install a display unit not specified by NEC.**

<Front view>

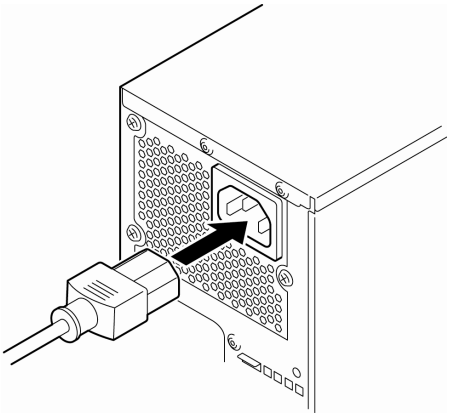


<Rear view>


A device with serial interface (such as a modem)
Finally, connect the provided power cord to an outlet.
Display unit
Hub/Switching hub
USB devices (such as a terminal adapter)

2.2.2 Power cord

Connect the provided power cord to the server.



Tips

- To connect the power cord to a UPS, connect it to the outlet provided at the rear of the UPS.
  For details, refer to the instruction manual supplied with the UPS
- In order to link the power supply from the UPS with the power-on/off of this server, the BIOS settings change might be required depending on the UPS to which the power cord of this server is connected.
  In the BIOS Setup Utility, select **Server**, and then **AC-LINK** to change the parameter to the appropriate value.

NEC Express5800 Series
Express5800/GT110d-S

3 Setup

This chapter describes how to set up the server.

1. **Turning on the Server**
   POST (Power-On Self-Test) is explained in this section.

2. **System BIOS Setup**
   You can customize BIOS settings by following the instructions in this section.

3. **EXPRESSSCOPE Engine 3**
   EXPRESSSCOPE Engine 3 provides useful features through the Baseboard Management Controller (BMC).

4. **EXPRESSBUILDER**
   EXPRESSBUILDER helps you to install Windows and maintain the server.

5. **Installing Software Components**
   You can install Windows and bundled software by following the instructions in "*Installation Guide (Windows)*".

6. **Turning off the Server**
   Turn off power when not using the server.

1. Turning on the Server

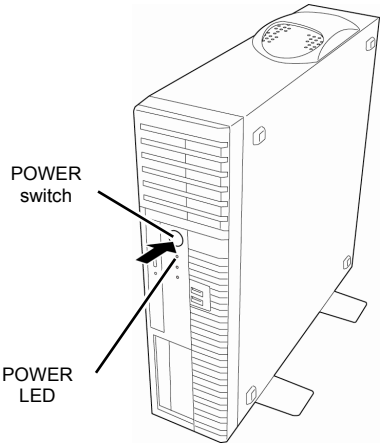
Turn on the server by using the following procedure.

Important **Wait for approximately 10 seconds before turning on the server again after the power has been turned off.**

1. Disconnect Flash FDD if applicable.
2. Turn on the peripheral devices that connect to the display monitor and the server.

Note If the power cord is connected to power control system such as an Uninterruptible Power Supply (UPS), make sure that the power control system is turned on.

3. Press the POWER switch at the front of the server.
   The POWER LED is turned on green and after a while, the NEC logo appears on the display. While the NEC logo is being displayed, the self-diagnostic program (POST) runs and diagnoses the hardware. For details, refer to Chapter 3 (*1.1 POST*).



1.1 POST

POST (Power-On Self-Test) is a self-diagnostic program stored in the server as standard. POST automatically runs immediately after the server is turned on and checks the motherboard, memory, processor (CPU), keyboard, and mouse. POST also displays the start-up messages of different utilities during the operation.

Usually, you do not need to check the contents of POST. However, check messages displayed at POST in the following cases.

- When introducing a server
- If you suspect a failure
- When you hear beep many times during the time between Power ON and OS startup
- When any error message is displayed

1.1.1 POST sequence

Explains how POST runs in order.

Important

- **Do not make key entries or perform mouse operations while POST is in progress.**
- **Some system configurations may display the message "Press Any Key" to prompt a key entry. This message is driven by BIOS of an installed optional board. Make sure to read the manual that comes with the optional board before any key entry.**
- **Powering on the server, after you installed or removed an optional PCI board or moved it to another slot, may display the message that indicates incorrect board configuration and suspend POST.**
  In such a case, press `F1` to continue POST. Board configuration can be made using the utility described later.

1. When the server is turned on, POST runs.

   POST starts memory check. When the memory check is completed, some messages appear.

   As factory settings, the NEC logo appears on the screen during POST.

2. If the <Esc> key is pressed, the logo disappears and the details of POST are displayed.

Tips

You can set it to show the details of POST to be displayed from **BIOS** menu without requiring the <ESC> key to be pressed. From the System BIOS Setup, set **Quiet Boot** to **Disabled** in the **Boot** menu.

3. POST displays several types of message. These messages let you know that the installed CPU or connected keyboard and mouse are detected.

Tips

Depending on the installed PCI card configuration, the memory capacity might be displayed less than actually installed physical memory. (This applies to the display of BIOS Setup utility or OS system information.)

4. After a while, the following message is displayed on the screen.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

By pressing the designated function key following messages, you can call the functions below upon completion of POST.

<F2> key: Run the SETUP. For information on the SETUP, refer to *Chapter 3 (2. System BIOS Setup)*.

<F3> key: Run EXPRESSBUILDER from Internal Flash Memory (optional). For information on EXPRESSBUILDER, refer to *Chapter 3 (4. EXPRESSBUILDER)*.

<F4> key: Run the offline tool. For information on the offline tool, refer to *Chapter 1 Maintenance (9. Offline Tools) in "Maintenance Guide"*.

<F12> key: Boot from network.

Note

- If the optional Internal Flash Memory is not installed in the system, the <F3> key message will not be displayed.
- The <F3> key must be pressed within 5 seconds of the message being displayed.
- Note that the server will not boot from the Internal Flash Memory even if it is specified to do so by pressing the <F3> key, as long as a bootable CD/DVD-ROM is set on the drive with the boot priority of CD/DVD-ROM is set to higher than Hard Drive.

5. If a controller which has its dedicated BIOS such as a SCSI controller board is installed, a message that prompts you to start the dedicated utility to set each board is displayed.

Example: SCSI BIOS Setup utility

```
Press <Ctrl> <A> for SCSISelect (TM) Utility!
```

The utility starts by pressing the <Ctrl> + <A> keys.

Example: If an optional RAID Controller is installed

```
Press <Ctrl> <H> for Web BIOS
```

The utility starts by pressing the <Ctrl> + <H> keys.

Example: If the jumper setting for an on-board RAID Controller is enabled

```
Press <Ctrl> <M> to Run LSI Software RAID Configuration Utility
```

The utility starts by pressing the <Ctrl> + <M> keys.

For details on the utility, refer to the manual supplied with each optional board.

Depending on the configuration, the message "Press Any Key" might appear to prompt a key entry. This is a behavior of the BIOS of the optional board. Continue to operate after checking the manual of the optional board.

6. If you set a password at **SETUP** in the BIOS Setup utility, the password entry screen appears upon successful completion of POST.
Up to three password entries will be accepted. Three incorrect password entries disable the server to boot. In such a case, turn off the power and wait about ten seconds before turning on to boot the server.

Important **Do not set a password before OS is installed.**

7. The OS starts when POST is completed.

1.1.2 POST Error Messages

When POST detects an error, it displays an error message on the screen or beeps for some errors. For descriptions of error messages, causes, and countermeasures, refer to "*Maintenance Guide*".

Important **Take notes on the messages displayed before consulting with your maintenance service company. Alarm messages are useful information for maintenance.**

2. System BIOS Setup

This section describes how to configure Basic Input Output System (BIOS).

Before you install the server and add or remove optional devices, make sure you have read and understood this section to configure properly.

2.1 Overview

SETUP is a utility to do basic hardware settings. This utility is pre-installed in the Internal Flash Memory in the server as standard and can be run without requiring a media for boot.

In most of cases, the SETUP was configured for optimal performance before the server was shipped to you. Therefore, in most of cases, you should not need to use the SETUP utility. **Use only when the case applies to any of cases described in *Chapter 3 (2.4 Cases that Require Configuration)*.**

2.2 Starting SETUP Utility

Run POST following *Chapter 3 (1.1.1 POST sequence)*.

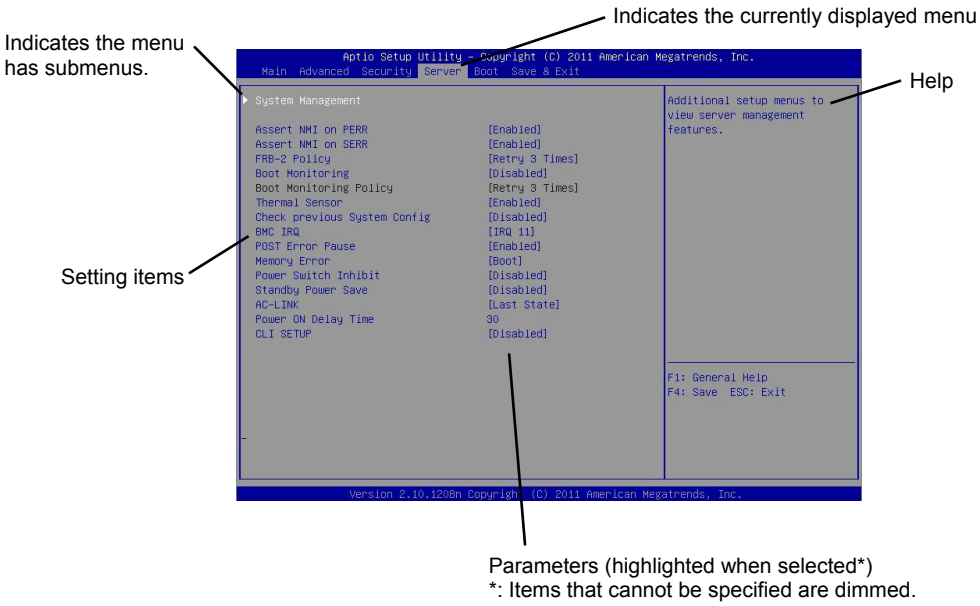
After a while, the following message will be displayed on the lower left of the screen.

```
Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
```

If you press the <F2> key at this time, SETUP runs and displays the **Main** menu upon completion of POST. (You can also press the <F2> key while the NEC logo appears to display the **Main** menu.)

2.3 Description on On-Screen Items and Key Usage

This section shows display examples and how to control the key. Use the keyboard to work with the SETUP utility.


Indicates the currently displayed menu
Indicates the menu has submenus.
Help
Setting items
Parameters (highlighted when selected*)
*: Items that cannot be specified are dimmed.
Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Security Server Boot Save & Exit
System Management
Assert NMI on PERR [Enabled]
Assert NMI on SERR [Enabled]
FRB-2 Policy [Retry 3 Times]
Boot Monitoring [Disabled]
Boot Monitoring Policy [Retry 3 Times]
Thermal Sensor [Enabled]
Check previous System Config [Disabled]
BMC IRQ [IRQ 11]
POST Error Pause [Enabled]
Memory Error [Boot]
Power Switch Inhibit [Disabled]
Standby Power Save [Disabled]
AC-LINK [Last State]
Power ON Delay Time 30
CLI SETUP [Disabled]
Additional setup menus to view server management features.
F1: General Help
F4: Save ESC: Exit
Version 2.10.1208n Copyright (C) 2011 American Megatrends, Inc.

- Cursor keys (<↑>, <↓>)
  Select an item displayed on the screen. If characters of an item are highlighted, that means the item is currently selected.
- Cursor keys (<←>, <→>)
  Select menus including **Main**, **Advanced**, **Security**, **Server**, **Boot**, and **Save & Exit**.
- <–> key/<+> key
  Change the value (parameter) of the selected item. You cannot use this key when a menu which has ▶ on the left is selected.
- <Enter> key
  Press this key to confirm the selected parameter.
- <Esc> key
  Pressing this key takes you to the previous screen. If you keep pressing the key, the following window is displayed. If you select **Yes**, the SETUP closes without saving the changed parameters.

Quit without saving?
[Yes] No

- <F1> key
  Press this key to display help information. If you need help using the SETUP, press this key. Press the <Esc> key to go back to the original screen.

- <F2> key
  If you press this key, the following window appears. If you select **Yes**, the previous parameter(s) are restored.

Load Previous Values?
[Yes] No

- <F3> key
  If you press this key, the following window appears. If you select **Yes**, restore the parameters of the currently selected item to the default setting. (**This might be different from the parameters configured before shipment.**)

Load Setup Defaults?
[Yes] No

- <F4> key
  If you press this key, the following window appears. If you select **Yes**, the parameter you configured is saved and SETUP closes.

Save configuration and exit?
[Yes] No

2.4 Cases that Require Configuration

Only if a case applies to any of following cases, use the SETUP utility to change a parameter which was configured as factory setting. Other than cases described below, do not change the settings. A list of SETUP parameters and factory settings are described in ***Chapter 2 (1. Details of System BIOS)*** **in "*Maintenance Guide*".**

Category	Description	To be changed	Remark
Basic	Change date and time	**Main → System Date** **Main → System Time**	Configurable on OS
	On/Off NumLock on power ON	**Boot → Bootup Numlock State**	
	On/Off the function to display the NEC logo during POST	**Boot → Quite Boot → Disabled**	By pressing the <Esc> key, prevent the display of the logo.
Optional board	Install RAID Controller board	**Advanced → PCI Configuration → PCI Slot n Option ROM → Enabled**	*n* is PCI slot number of the RAID Controller
Boot	Change the boot order of devices	**Boot → Boot Option Priorities →** Change the boot priority	
	Use remote power on function (from modem)	**Advanced → Advanced Chipset Configuration → Wake On Ring → Enabled**	
	Use remote power on function (from RTC alarm)	**Advanced → Advanced Chipset Configuration → Wake On RTC Alarm → Enabled**	
	Control from HW console terminal	**Advanced → Serial Port Configuration** → Change respective setting.	
Security	Set a password	**Security → Administrator Password** → Enter a password (Set a password for Administrator first and then User)	There are two types of password; Administrator and User. Settings for User password is limited compared to for Administrator.
UPS Powerlink	When the server is supplied with power from UPS, always turn on the power.	**Server → AC-LINK → Power On**	
	If it is turned off by using POWER switch, leave it OFF even when UPS supplies power.	**Server → AC-LINK → Last State**	
	Keep the power OFF even when UPS supplies power.	**Server → AC-LINK → Remains off**	

Password

If you have set a password, a message prompt you to enter password will be displayed from the next time.

```
Enter password [                ]
```

You can attempt password entry up to 3 times. **If you entered a wrong password 3 times, operation stops.** (You cannot operate further.) Turn off the power.

Saving changes

If you finish configuration, select **Save & Exit** and then **Save Changes and Exit** to save changes and exit.

If you wish to exit without saving the changed parameters, select **Save & Exit** and then **Discard Changes and Exit**.

Or if you wish to restore the setting to default values, select **Save & Exit** and then **Load Setup Defaults**.

(**The default value might be different from the factory setting.**)

3. EXPRESSSCOPE ENGINE 3

3.1 Overview

EXPRESSSCOPE Engine 3 provides a variety of features using BMC (Baseboard Management Controller), which is a system management LSI.

EXPRESSSCOPE Engine 3 monitors the power unit, fans, temperature, and voltage of the server. If you have the management LAN port connected to the network, you can remotely perform the following over a web browser or SSH client:

- Manage the server
- Remotely control the keyboard, video, and mouse (KVM)*
- Remotely access a CD/DVD/floppy disk/ISO image/USB memory*.

* To enable this feature, the optional license for remote management (N8115-04) is required.

3.2 EXPRESSSCOPE ENGINE 3 Network configuration

To enable EXPRESSSCOPE Engine 3 to be used via network, network configuration is required.

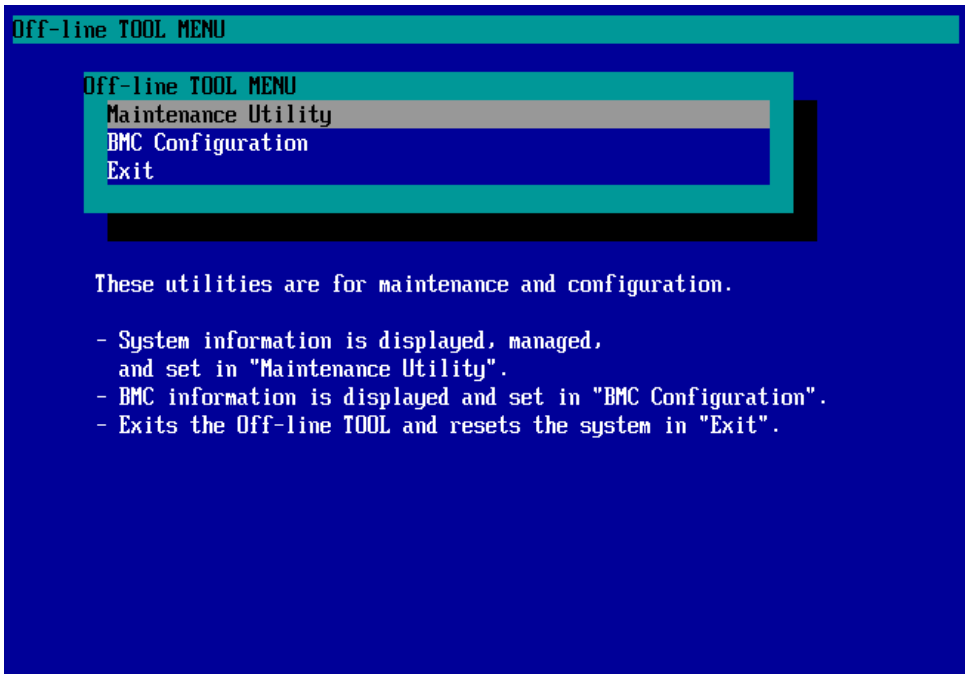
The following procedure describes how to enable the use of the engine on web browsers.

1. Run POST following *Chapter 3 (1.1.1 POST sequence)*. Wait until the following message appears on the lower left of the screen.

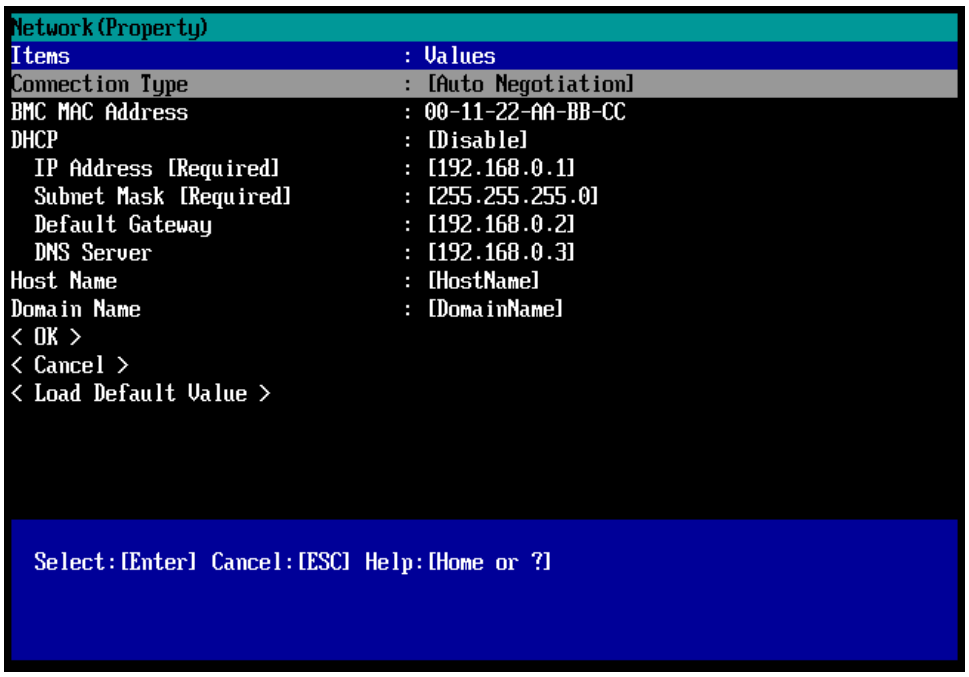
   ```
   Press <F2> SETUP, <F3> Internal Flash Memory, <F4> ROM Utility, <F12> Network
   ```

2. If you press the <F4> key at this time, ROM utility starts upon completion of POST. You can also press the <F4> key while the NEC logo is being displayed to open the Off-line TOOL MENU screen.
3. The keyboard selection screen appears. Select your keyboard type.
   After that, the Off-line TOOL MENU screen appears. On this screen, specify the network settings for EXPRESSSCOPE Engine 3.

4. When the Off-line TOOL MENU appears, select **BMC Configuration**, **BMC Configuration**, **Network**, and then **Property**.


Off-line TOOL MENU
Off-line TOOL MENU
Maintenance Utility
BMC Configuration
Exit
These utilities are for maintenance and configuration.
- System information is displayed, managed,
and set in "Maintenance Utility".
- BMC information is displayed and set in "BMC Configuration".
- Exits the Off-line TOOL and resets the system in "Exit".

5. If **Property** is selected, the following screen is displayed. On this screen, specify whether to use DHCP and if DHCP is not used, configure IP Address/Subnet Mask.


Network(Property)
Items : Values
Connection Type : [Auto Negotiation]
BMC MAC Address : 00-11-22-AA-BB-CC
DHCP : [Disable]
IP Address [Required] : [192.168.0.1]
Subnet Mask [Required] : [255.255.255.0]
Default Gateway : [192.168.0.2]
DNS Server : [192.168.0.3]
Host Name : [HostName]
Domain Name : [DomainName]
< OK >
< Cancel >
< Load Default Value >
Select:[Enter] Cancel:[ESC] Help:[Home or ?]

6. Connect the LAN cable to the management LAN connector in order to connect to the network. It will be available for use if you access EXPRESSSCOPE Engine 3 via Web browser from PC for management according to the setting.

4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER

EXPRESSBUILDER provides the following features.

Features	Descriptions
Setup (Windows reinstallation)	Installs Windows on your server. Easily completes the process from RAID configuration to installation of applications. To use this feature, select **Os installation** in the menu after boot.
Storage of software*	Stores various bundled software (such as NEC ESMPRO Agent).
Maintenance	Diagnoses your server system. To use this feature, select **Tool menu** in the menu after boot.
Storage of documents*	Stores various documents (including "*User's Guide*", "*Installation Guide*" and "*Maintenance Guide*").

*Documents and some software components are not stored in N8115-05 Internal Flash Memory (option).

4.2 Starting EXPRESSBUILDER

If you want to install Windows, start EXPRESSBUILDER by using any of the following.

EXPRESSBUILDER DVD:

Set the DVD on the drive and either turn on the server or restart the server by pressing <Ctrl> + <Alt> + <Delete>. EXPRESSBUILDER is booted from DVD.

N8115-05 Internal Flash Memory (option):

During POST, press <F3>. If you start with this option, **make sure that the media was removed from the drive.**

5. Installing Software Components

Continue to install software components such as OS.

Refer to the instructions below.

- Installation Guide (Windows)

6. Turning Off the Server

Turn off the server by using the following procedure. If the power cord of the server is connected to a UPS, refer to the documentation supplied with the UPS or the documentation for the application controlling the UPS.

1. Shut down the OS.
2. If the server does not automatically power off, press the POWER switch at the front of the server. Confirm that POWER LED is OFF.
3. Turn off peripheral devices.

NEC Express5800 Series
Express5800/GT110d-S

4 Appendix

1. Specifications

2. Interrupt Lines

I. Specifications

I.I Air-cooling System

Product name		Express5800/GT110d-S, EXP281A			
		N8100-1739F		N8100-1740F	
Specifications on shipment		3.5-inch Hard Disk Drive model		2.5-inch Hard Disk Drive model	
CPU	Type	Intel® Pentium® processor G620	Intel® Xeon® processor E3-1220	Intel® Pentium® processor G620	Intel® Xeon® processor E3-1220
	Clock/cache	2.60 GHz/3 MB	3.10 GHz/8 MB	2.60 GHz/3 MB	3.10 GHz/8 MB
	Standard / (maximum)	Not pre-installed / (1)			
Chipset		Intel® C204 Chipset			
Memory	Standard	Not pre-installed			
	Maximum	32 GB (8 GB x 4)			
	Expansion unit	DDR3-1333 SDRAM DIMM (unbuffered) x 1			
	Memory module	ECC DDR3-1333 SD-RAM DIMM with dual channel memory support			
Graphics		Integrated in BMC (more than 32 MB)			
Auxiliary storage	Hard Disk Drive (standard)	Not pre-installed			
	Hard Disk Drive (maximum)	3.5-inch: SATA 4 TB (2 TB x 2)		2.5-inch: SATA 5 TB (1 TB x 5) 2.5-inch: SAS 3 TB (600 GB x 5)	
	Solid state drive	2.5-inch: SATA 500 GB (100 GB x 5) (option)			
	Optical disk drive	SATA RAID 0/1(standard*1, option)		SATA: RAID 0/1 (standard); RAID5 (option) SAS: RAID 0/1/5 (option)	
	Hard Disk Drive (standard)	Standard: DVD-ROM drive Option: DVD SuperMULTI drive (replaces the DVD-ROM drive)			
Expansion bay	Disk bay	3.5-inch Hard Disk Drive x 2		2.5-inch Hard Disk Drive x 5 (option)	
	3.5-inch disk bay	1 slot			
Expansion slot (PCI)		– PCI EXPRESS 1 slot (x8) (x8 socket) – PCI EXPRESS 2 slot (x4) (x8 socket) – 32-bit/33 MHzx1 slot			
External interface	USB	Front: 2 ports; rear: 4 ports; internal: 2 ports (version 2.0 compatible)			
	Serial	1 port (D-sub 9-pin)*2			
	Network	2 ports 100Base-T, 100Base-TS/10Base-T (RJ-45) Management LAN port (RJ-45)			
	Display	MINI D-sub 15-pin (1 port)			
External dimensions		93.0 mm (width) × 386.5 mm (depth) × 363.0 mm (height) (not including air duct, stabilizer, protrusions) 190.0 mm (width) × 396.5 mm (depth) × 386.5 mm (height)) (air duct, stabilizer, protrusions included)			
Mass (maximum)		9 kg (12 kg)			
Power supply		100/200 VAC ± 10%, 50/60 Hz ± 3Hz			
Power rating		237 W	247 W	229 W	239 W
Environmental conditions	When running	Temperature: 10 to 40°C; Humidity: 20 to 80% (and no condensation)			
	When in storage	Temperature: –10 to 55°C; Humidity: 20 to 80% (and no condensation)			
Bundled OS		None			
Supported OSs		Windows Server 2008 R2 Standard Windows Server 2008 R2 Enterprise Windows Server 2008 R2 Foundation Windows Server 2008 Standard Windows Server 2008 Enterprise Windows Server 2003 R2 Standard x64 Edition*3 Windows Server 2003 R2 Standard Edition*3 Windows Server 2003 Standard Edition*3 Red Hat Enterprise Linux 5 Server (x86) Red Hat Enterprise Linux ES 4 (x86) Red Hat Enterprise Linux 5 Server (EM64T) Red Hat Enterprise Linux ES 4 (EM64T)			
Included parts		104 keyboard, two-button mouse with scroll wheel, air duct, rubber feet, EXPRESSBUILDER DVD, Getting Started, screws for device, Power code			

*1 For Linux OS, onboard RAID feature is not supported.

*2 Can be optionally expanded to two ports.

*3 Service Pack2 or later

1.2 Water-cooling System

Product name		Express5800/GT110d-S (2C/i3-2120), EXP281A	
		N8100-1741F	N8100-1742F
Specifications on shipment		3.5-inch Hard Disk Drive model	2.5-inch Hard Disk Drive model
CPU	Type	Intel® Core™ -i3 processor i3-2120	
	Clock/cache	3.30 GHz/3 MB	
	Standard / (maximum)	No standard / (1)	
Chipset		Intel® C204 Chipset	
Memory	Standard	Not pre-installed	
	Maximum	32 GB (8 GB x 4)	
	Expansion unit	DDR3-1333 SDRAM DIMM (unbuffered) x 1	
	Memory module	ECC DDR3-1333 SD-RAM DIMM with dual channel memory support	
Graphics		Integrated in BMC (more than 32 MB)	
Auxiliary storage	Hard Disk Drive (standard)	Not pre-installed	
	Hard Disk Drive (maximum)	3.5-inch: SATA 4 TB (2 TB x 2)	2.5-inch: SATA 3 TB (1 TB x 3) 2.5-inch: SAS 2.7 TB (600 GB x 3)
	Solid state drive	2.5-inch: SATA 500 GB (100 GB x 5) (option)	
	Optical disk drive	SATA RAID 0/1(standard*1, option)	SATA: RAID 0/1 (standard); RAID5 (option) SAS: RAID 0/1/5 (option)
	Hard Disk Drive (standard)	Standard: DVD-ROM drive Option: DVD SuperMULTI drive (replaces the DVD-ROM drive)	
Expansion bay	Disk bay	3.5-inch Hard Disk Drive x 2	2.5-inch Hard Disk Drive x 3
	3.5-inch disk bay	1 slot	
Expansion slot (PCI)		– PCI EXPRESS 1 slot (x8) (x16) – PCI EXPRESS 2 slot (x4) (x8 socket)	
External interface	USB	Front: 2 ports; rear: 4 ports; internal: 2 ports (version 2.0 compatible)	
	Serial	1 port (D-sub 9-pin)*2	
	Network	2 ports 100Base-T, 100Base-TS/10Base-T (RJ-45) Management LAN port (RJ-45)	
	Display	MINI D-sub 15-pin (1 port)	
External dimensions		93.0 mm (width) × 386.5 mm (depth) × 363.0 mm (height) (not including air duct, stabilizer, protrusions) 190.0 mm (width) × 396.5 mm (depth) × 386.5 mm (height)) (air duct, stabilizer, protrusions included)	
Mass (maximum)		9 kg (12 kg)	
Power supply		100/200 VAC ± 10%, 50/60 Hz ± 3Hz	
Power rating		183 W	175 W
Environmental conditions	When running	Temperature: 10 to 40°C; Humidity: 20 to 80% (and no condensation)	
	When in storage	Temperature: –10 to 55°C; Humidity: 20 to 80% (and no condensation)	
Bundled OS		None	
Supported OSs		Windows Server 2008 R2 Standard Windows Server 2008 R2 Enterprise Windows Server 2008 R2 Foundation Windows Server 2008 Standard Windows Server 2008 Enterprise Windows Server 2003 R2 Standard x64 Edition*3 Windows Server 2003 R2 Standard Edition*3 Windows Server 2003 Standard Edition*3 Red Hat Enterprise Linux 5 Server (x86) Red Hat Enterprise Linux ES 4 (x86) Red Hat Enterprise Linux 5 Server (EM64T) Red Hat Enterprise Linux ES 4 (EM64T)	
Included parts		104 keyboard, two-button mouse with scroll wheel, air duct, rubber feet, EXPRESSBUILDER DVD, Getting Started, screws for device, Power code	

*1 For Linux OS, onboard RAID feature is not supported.

*2 Can be optionally expanded to two ports.

*3 Service Pack2 or later

2. Interrupt Lines

Interrupt lines are assigned as factory settings as shown below. Use this table as a reference when you add optional devices.

- **Interrupt lines**
  As factory settings, interrupt lines are assigned as follows.

IRQ	Peripheral Device (Controller)	IRQ	Peripheral Device (Controller)
0	System timer	8	Real-time clock
1	–	9	Microsoft ACPI-Compliant System
2	Cascade connection	10	PCI
3	COM 2 serial port	11	PCI
4	COM 1 serial port	12	–
5	PCI	13	Arithmetic operation processor
6	–	14	Primary IDE
7	–	15	Secondary IDE